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CLIMATE REPORT 2022

ALS Northern Europe

Greenhouse Gas Emissions Inventory Report

June 2022

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1. Executive summary

Scope:

- Base year: Fiscal year (FY) 2020.
- Reporting period: April 1st 2021 – March 31st 2022 (FY 2022).
- Organisational consolidation approach: Operational control.
- Operational boundaries: Scopes 1 and 2 emissions, and selected scope 3 emissions.

Key results:

- ALS Life Sciences Northern Europe has developed a challenging climate vision with the long-term strategic target of achieving climate neutrality by 2035.
- We have compiled a greenhouse gas (GHG) emissions inventory using the guidance of the GHG Protocol. The inventory contains activity data and emission factors for a range of emission sources primarily located in scopes 1 and 2 including natural gas, fuel, electricity, and heating. For scope 3 we have so far included emissions for selected suppliers of glass and plastics goods, external logistics services used for transportation purposes, and business travel.
- Total quantified emissions decreased by 18.4% from FY 2020 to FY 2022.
- The total scopes 1 and 2 emissions decreased by 41.8% from FY 2020 to FY 2022 primarily due to lower emissions from electricity at our Danish site, which started purchasing renewable energy in 2021. Our main category of emissions in these scopes is now from fuel followed by natural gas.
- Total quantified scope 3 emissions increased by 21.7% from FY 2020 to FY 2022 with emissions from purchased goods and services being the main contributor. We expect to add additional scope 3 categories and emission sources in the coming years, which will add significantly to our total emissions. The main focus in the current fiscal year of 2023 will be the inclusion of emissions from waste, employee commuting and additional purchased goods.
- Our laboratory sites in Danderyd (Sweden) and Humlebæk (Denmark) emit the largest amounts of emissions of the eight sites that are currently part of ALS NE. These sites also have the greatest potential for reducing emissions, and multiple reduction projects have already been carried out or commenced to reduce emissions in all scopes.
- ALS NE intends to continuously purchase certified carbon credits to offset those of our emissions that cannot be reduced due to technological limitations. We are currently investing credits in a rice husk power project in Cambodia, which not only results in reduced GHG emissions, but also supports sustainable development in the local area.

2. Introduction

In December 2019, the European Commission introduced an ambitious proposal to make the bloc climate-neutral by 2050. ALS Life Sciences Northern Europe (ALS NE) has gone beyond that and has developed a challenging climate vision with the long-term strategic target of achieving climate neutrality by 2035. Our strategy towards this target will be a combination of real emissions reductions and carbon offsets or credits to cancel out the emissions that we cannot eliminate or reduce further due to temporal or technological limitations.

In 2021, we started to collect data with the purpose of calculating our emissions of greenhouse gasses, and we are now ready to present our progress to clients, suppliers, and other collaboration partners. This report provides an overview of ALS NE's greenhouse gas (GHG) emissions in the last three fiscal years. The data inventory underlying the report is based on the international standard, A Corporate Accounting and Report Standard, developed by the Greenhouse Gas Initiative (GHG Protocol). We have used the guidance of this standard throughout our work to ensure that our emissions are both accurate and representative.

While our main goal in compiling a GHG inventory is to quantify our GHG emissions, it will also be a valuable tool in understanding our climate impact as a business and be able to identify opportunities to initiate and track reduction projects.

2.1 ALS Life Sciences Northern Europe

The map in Figure 2.1 shows the location of the eight sites included in ALS Life Sciences Northern Europe. Samples are regularly shipped between the environmental sites in Danderyd, Luleå, Humlebæk and Oslo.

2.2 Targets and milestones

ALS NE's long-term target is Nordic climate neutrality by 2035 i.e. no net emissions of greenhouse gasses from our life sciences operations in Scandinavia.

Figure 2.1 – ALS (LS) NE sites in Scandinavia. Abbreviations: LU = Luleå, ON = Oslo, SRP = Sarpsborg, SLL = Sollentuna, TA = Danderyd, HKI = Helsinki, HMB = Humlebæk, LKN = Landskrona.

3. Calculation methodology

Calculations and analyses are carried out according to the latest edition of the international standard "*The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard*" (2004), developed by the Greenhouse Gas Protocol Initiative. The Greenhouse Gas Protocol (from here on referred to as the GHG Protocol) is, along with the ISO standard 14064, the most widely used and recognized international standard for identifying, calculating, and reporting GHG emissions.

Using the guidance described in the GHG Protocol, ALS NE has compiled a GHG emissions inventory (GHG inventory), which allows us to calculate the emissions from our operations using emission activity data from both internal and external sources (cf. section 3.6) multiplied by appropriate GHG emissions factors (cf. section 3.7). This section describes the methodology used to carry out the calculations including our decisions on the scope of the inventory regarding geography, time period, and emission sources. We also address the uncertainty associated with our calculation methodology before presenting the main results from our GHG inventory in Chapter 4.

3.1 Reporting period

The focus of this report is the fiscal year 2022 (FY 2022) corresponding to the 12-month period from the 1st of April 2021 to the 31st of March 2022. However, as this is the first climate report published by ALS NE, it also covers the calculated GHG emissions in fiscal years 2021 and 2020 (our base year, cf. section 3.2).

Unless otherwise stated, years in this report always refer to ALS NE's fiscal years.

3.2 Base year

As required by the GHG Protocol, ALS NE has selected an inventory base year, which allows us to track our GHG emissions over time using the base year emissions as our benchmark level. We have chosen our fiscal year of 2020 (April 1st, 2019, to March 31st, 2020) as the base year for our inventory, which coincides with the base year selected by our parent company, ALS Limited, based in Australia.

The base (fiscal) year of 2020 was selected for multiple reasons:

- While activity data for both scope 1 and 2 emission sources (cf. section 3.6) is readily available for multiple years before 2020, this is not the case for many of the emission sources found in scope 3 (cf. section 3.6.3). Because it is ALS NE's ambition to include emissions from all three scopes, it will be an advantage to work with a recent base year, as it increases the probability of successfully obtaining scope 3 activity data from the suppliers in our value chain.
- Our fiscal year of 2020 ended immediately after the onset of the global COVID-19 pandemic in the winter of 2019/2020. Therefore, while the emissions of 2021 and 2022 are influenced to some degree by the pandemic and its impact on the business, the base year will constitute a 'normal' year to which the coming years can be compared directly to.
- The pharmaceutical laboratories in Sollentuna and Landskrona were acquired by ALS NE in calendar years 2017 and 2018, respectively. By choosing a base year following these acquisitions, we avoid the difficulties associated with locating data from before these laboratories were incorporated into ALS NE.

- The choice ensures that our base year is the same as the one selected by another European business unit, ALS Life Sciences Western Europe, which we expect to be one of our closest collaboration partners in calculating emissions from our value chain (scope 3 emissions).

In relation to our long-term strategy goal of becoming climate neutral by 2035 (cf. section 2.2), FY 2020 also constitutes our target base year as defined by the GHG Protocol.

3.2.1 Recalculation policy

This report contains the first published set of emissions data for ALS NE, and while great efforts have been made to ensure the numbers are both accurate and precise, we expect to continuously revise and update emission values in future reports going back to the base year. These updates will partly be due to our ongoing work to obtain more representative activity data and more up-to-date emission factors, and partly because of changing business conditions and structures expected to affect our GHG inventory.

In accordance with the GHG Protocol, we intend to assess our inventory every year and evaluate the need to recalculate emissions from previously reported years including the base year. Recalculation of emissions for already reported years will generally be carried out in the following cases:

- Structural changes such as acquisitions or divestments.
- Addition of scope 3 categories and expansion of categories already included in the inventory.
- Changes in calculation methodology for included emissions sources.
- Improvements in data accuracy for activity data already included in the inventory.
- Significant changes to emission factors used to calculate emissions in previous years. Such changes will result in increased representability (scientific, geographical, or temporal) for the emission sources in question.

To avoid the need for frequent recalculations, ALS NE has decided to only recalculate our GHG inventory following substantial changes in the above-mentioned factors that result in significantly different emission values. A significance threshold of 5% has been defined for changes in emissions from individual or accumulated smaller changes to the conditions underlying the inventory. This is done to ensure stability and simplify the process of managing inventory data.

By following the recalculation policy stated above we will be able to maintain a high level of consistency and comparability in our GHG emissions inventory. ALS NE intends to keep a detailed log of all major changes to the inventory (activity data, calculation methods, and emission factors), which will allow us to adhere to our calculation policy and ensure adequate documentation as required by the GHG Protocol.

3.3 Organisational boundaries

ALS NE has defined the organisational boundaries of the inventory with reference to the methodology described in the GHG Protocol. We apply the operational control approach when consolidating our GHG inventory and thus account for all GHG emissions from sources over which we have full operational control.

The following laboratory and office sites are included in ALS NE's GHG inventory:

Table 3.1 – Nordic sites included in the GHG inventory for ALS NE.

Site	Abbreviation	Country	Business	Type
Danderyd	TA	Sweden	Environmental	Laboratory
Luleå	LU	Sweden	Environmental	Laboratory
Sollentuna	SLL	Sweden	Pharmaceutical	Laboratory
Landskrona	LKN	Sweden	Pharmaceutical	Laboratory
Oslo	ON	Norway	Environmental	Office
Sarpsborg*	SRP	Norway	Environmental	Laboratory
Humlebæk	HMB	Denmark	Environmental	Laboratory
Helsinki	HKI	Finland	Environmental	Office

*The process of closing the Sarpsborg site was initiated in 2021 and is expected to be finished in 2025.

3.4 Operational boundaries

The operational boundaries of the GHG inventory were set using the methodology described in the GHG Protocol. The inventory is divided into three main scopes of direct and indirect emissions:

- **Scope 1 – Direct GHG Emissions:** Emissions that occur from sources controlled by ALS NE, e.g. emissions from combustion boilers, furnaces, vehicles, and refrigeration equipment.
- **Scope 2 – Electricity Indirect GHG Emissions:** Emissions from the generation of acquired and consumed electricity, heat, and cooling (collectively referred to as "electricity").
- **Scope 3 – Other Indirect GHG Emissions:** Emissions that are the consequence of activities carried out by ALS NE, but occurs at sources not controlled by the company, e.g. production of purchased goods and services, outsourced transportation, business travel, and employee commuting.

The GHG Protocol mandates the inclusion of all relevant and significant scopes 1 and 2 emissions, while emissions in scope 3 are optional according to the protocol. However, it has been the expectation from the very beginning of our work with GHG emissions that the scope 3 emissions from our value chain will constitute the majority of ALS NE's total emissions. For this reason, we have set out to include scope 3 emissions in the GHG inventory presented in this report, though we acknowledge that a complete overview and quantification of the scope will be a prolonged and demanding process. We strive to report our scope 3 emissions according to the *"Corporate Value Chain (Scope 3) Standard"* in the future, as our work is progressing.

ALS NE currently includes scopes 1 and 2 emissions as well as selected scope 3 emissions in our GHG inventory. We have identified relevant scope 3 categories based on their perceived importance relative to the scopes 1 and 2 emissions (cf. section 3.6.3). Such importance could refer to the expected size of the emissions, the emissions considered to be most important to clients and stakeholders, or the emission categories with the greatest reduction potential. At the moment, ALS NE's GHG inventory includes the following three scope 3 categories:

- Purchased goods and services
- Upstream transportation and distribution
- Business travel

However, none of the categories mentioned above is fully accounted for due to lack of reliable data. The collection of data and emissions sources is an ongoing work, and we hope to be able to report a more accurate result of emissions in these categories in our next climate report. We also expect to include additional categories in the coming years, where we will be focusing on the upstream categories as defined in the GHG Protocol. This is because the main product delivered by ALS NE is laboratory analysis services that do not produce physical products with corresponding downstream emissions. Most of the downstream scope 3 categories are therefore not relevant to our business.

3.4.1 Location-based and market-based scope 2 emissions

To comply with the GHG Protocol Scope 2 Guidance, ALS NE has chosen to calculate and report scope 2 emissions using both the *location-based* method and the *market-based* method. This makes sense to us, as most of our sites purposefully have chosen to purchase certified renewable energy rather than obtaining electricity from the residual mix available in the Nordic market. For this reason, our emissions calculated using the market-based method will be significantly lower (and more representative) than the emissions calculated from the location-based method.

When calculating emissions using the **location-based** method, national or Nordic grid-average emission factors for electricity, heating etc. are used. On the other hand, when calculating emissions using the **market-based** method, supplier-specific emission factors for the contractually obligated energy products are used instead. Scope 2 and total emissions are generally reported using both methods in this report, except when reviewing emission data specific to countries, scopes, or categories. In these cases, only emissions calculated using the market-based method is included.

3.5 Inventory management

ALS NE's GHG inventory is compiled using Microsoft Excel, as no external software has so far been found suitable for our business' needs. The inventory allows for simple data entry of activity data for a range of different emission sources, which is then registered to individual sites in specific months of the year. All intermediate activity data calculations and estimations are carried out in separate files stored alongside the inventory itself. Energy and density conversions of activity data are made based on publicly available or supplier-provided conversion factors.

The GHG inventory is managed by the Nordic GHG Emissions Controller, who is the main person responsible for collecting activity data and identifying and updating emission factors. The inventory is also accessed by the Nordic Environmental Coordinator, who along with the environmental specialists located at each site support our GHG work with their local site knowledge and supplier contacts.

While the input data to the inventory might be in different units (kWh, litre, kg, tkm etc.), the unit of the final calculated emissions is tonnes of carbon dioxide equivalents (t CO_2e). CO_2-equivalents are used to capture the climate change potential of different greenhouse gasses. These greenhouse gasses contribute to global warming according to their global warming potential (GWP) as reported by the IPCC.[1] According to the GHG Protocol, companies should include and be able to report emissions of all six greenhouse gasses listed in the Kyoto Protocol: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6). It is our goal in ALS NE to be able to report emissions by the individual gasses, but at the moment we exclusively report emissions as t CO_2e. This is due to a lack of available information on the breakdown by gas for most of the emission factors currently used to calculate emissions.

For the leaked refrigerant emissions reported as part of scope 1 (cf. section 3.6.1), CO_2e-values are calculated directly using the latest published GWP-values in IPCC's Fifth Assessment Report (AR5) from 2014. The GWP-values are for a 100-year time horizon.

ALS NE is planning to have the GHG inventory internally audited by employees involved in quality control and then reviewed by management. The audit will include not only the compiled data itself, but also assess the information management process and evaluate the tools used to update the inventory.

3.6 Activity data

The activity data registered in our GHG inventory mainly consist of information obtained from supplier invoices and reports, internal statistics, and various HR and accounting systems. Complete sets of primary data dating back to the base year have been collected whenever possible, preferably specific to the individual site and month. Registering the data on a monthly basis allows us to easily aggregate it into reporting periods based on our fiscal years.

The collected activity data included in this report generally covers all the scopes and categories defined by the organisational boundaries (cf. section 3.4) for the last three fiscal years (FY 2020 – 2022). One major exception is FY 2020 data for mobile combustion and external logistics services (upstream transportation and distribution) for the Norwegian sites Oslo and Sarpsborg. This data would mainly be collected from invoices, however, due to technical difficulties in accessing a now discontinued invoicing system, only emissions from a single supplier in this category have been calculated. Other minor deviations from complete data sets are mentioned when relevant in the results section.

ALS NE has chosen to geographically register data on site level to better be able to locate significant emission sources and identify emission reduction projects specific to the individual sites. However, data is not always available for each site, but rather for multiple sites or whole countries. In these cases, activity data is allocated to sites based on distribution keys, which are usually calculated using a purchase cost index value. As an example, selected external logistics companies in Sweden provide services to both the Danderyd and Luleå sites, but do not specify on their invoices how the services have been divided between the two sites. The accounting department, however, holds information on how the invoiced supplier expenses have been allocated to Danderyd and Luleå, respectively. Thus, an index value can

[1] CO_2e is the universal unit of measurement for GHG emissions. It is calculated using the global warming potential (GWP) of greenhouse gasses defined in units of carbon dioxide. CO_2-equivalents allow for the evaluation of different greenhouse gasses using a common unit.

be calculated and used as a distribution key to allocate this supplier's activity data (and related GHG emissions) between the sites.

For certain emissions sources, primarily in scope 3, data has been either incomplete or unsuitable for direct input into the GHG inventory. In these cases, conservative assumptions and modelling have been necessary to estimate the activity data and its associated emissions. The methods used for estimating such activity data are described in detail in internal GHG documents.

To provide a clear picture of the activity data currently included in ALS NE's GHG inventory, the emission sources included in each of the three scopes are described in the next subsections.

3.6.1 Scope 1 emissions

The following (direct) scope 1 emissions are included in the inventory:

Natural gas: The laboratory site in Humlebæk, Denmark, uses natural gas to heat its buildings during the year. As the gas is burned on-site, its related emissions are categorized as direct scope 1 emissions. Total annual consumption data is provided by the gas supplier at the beginning of each calendar year. The gas consumption is then distributed to individual months using nationally published heating degree days[2].

Fuel: Fuel data for vehicles at the Danderyd, Humlebæk, and Oslo sites are collected using the monthly invoices received from major fuel suppliers as well as the receipts provided by employees with company cars and credit cards. Data consists of volumes of petrol, diesel, and biodiesel (HVO 100), respectively.

Refrigerants: There is a risk of direct emissions of refrigerants with high GWP-values at the two laboratory sites in Danderyd and Humlebæk. Regular service reports from the Swedish site are used to monitor potential leaks or spills of refrigerants, however, none has been identified yet. For the Danish site in Humlebæk, leaks are quantified from refilled amounts of refrigerants listed on invoices for service visits related to leaking A/C equipment.

Excluded emission sources and the uncertainty of the activity data in this scope are addressed in later sections.

3.6.2 Scope 2 emissions

The following (indirect) scope 2 emissions are included in the inventory:

Electricity: In the reporting period, all eight of the Nordic sites have purchased electricity from external suppliers in their local area. Depending on the circumstances for the individual site, monthly electricity consumption data is obtained from supplier-issued invoices, invoices from the building landlord, or from communication with the supplier themselves. For the sites in Oslo and Sollentuna, no direct measurement of the electricity consumption is made – instead the landlord allocates a share of the total consumption for the building to ALS NE based on its floor area occupancy.

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[2] Heating (or cooling) degree days are used to quantify the demand for energy necessary to heat (or cool) a building. Using monthly values of degree days allows us to take temperature variations into account when we allocate our gas consumption to individual months.

In addition to the electricity consumption in the buildings of the respective sites, ALS NE has been purchasing electricity from external suppliers to charge electric vehicles (EVs) in the spring of 2021. Thus, from the fiscal year of 2022 the electricity charged by EVs has been recorded as well using a combination of invoice statements and estimations based on purchase cost.

District heating: Five of the Nordic sites (Danderyd, Luleå, Sollentuna, Oslo, and Helsinki) use district heating or another type of heating to warm their laboratory and/or office facilities. However, only the Luleå site has actual meters for measuring the heat consumption at the site, which is stated on the monthly invoices received from their energy supplier. The Danderyd site receives calculated annual consumption data from its landlord based on its floor area share of the building, but no heat consumption data is available for the three remaining sites. Therefore, to be able to calculate the emissions from the energy generation needed to heat these sites, we have used the known consumption values from the Luleå and Danderyd sites to create a floor area index value (kWh/m^2). This value has then been used to estimate the purchased energy needed to heat the Sollentuna, Oslo, and Helsinki sites from their respective floor areas.

Excluded emission sources and the uncertainty of the activity data in this scope are addressed in later sections.

3.6.3 Scope 3 emissions

The following scope 3 emission categories are currently included in the inventory:

1. Purchased goods and services: As a major provider of laboratory services, ALS NE purchases large quantities of a variety of goods from many different suppliers. Many of these goods fall into one of the following categories: Sample containers, laboratory disposables, chemicals, and gasses.

It was our expectation, going into scope 3, that plastic and glass products used for sampling and analysis purposes would be some of the major emission sources in this category. We have therefore obtained purchase data from our main supplier of sample containers and laboratory disposables and used their product-specific information to calculate total purchased amounts (kg) of glass and plastics. The main types of plastics used in the products are polyethylene (PE), polypropylene (PP), polyethylene terephthalate (PET), and polystyrene (PS). So far, we have managed to estimate the glass and plastic contents in 94.4% of the products delivered by the supplier in question.

In addition to glass and plastic, we have also collected data on our gas purchases for analytical use at three of our environmental sites, Danderyd, Luleå, and Humlebæk. Argon gas in particular is used at all three sites for metal analysis, but quantities of carbon dioxide, helium, hydrogen, nitrogen, and oxygen gas are also regularly purchased. Purchased quantities have been collected from the supplier invoices.

4. Upstream transportation and distribution: ALS NE has an extensive logistics network covering all of Scandinavia. In addition to our own company vehicles used for sample collection and sample container delivery (mainly in Humlebæk and Danderyd), we also employ a wide range of external logistic companies in Northern Europe to provide these services to our clients. Additionally, we use multiple different transportation companies such as DHL and Jetpak to ship samples internally between our many laboratories all over the world.

Collection of activity data for this category is specific to the individual supplier and the information currently available to us from invoices, internal statistics, and annual carbon footprint reports. Some suppliers offer data on the GHG emissions from their services calculated using the EN 16258 standard on GHG emissions of transport services. In the last three fiscal years, approximately 82-92% of our annual emission data in the transportation and distribution category was received directly from the supplier. The remaining 8-18% of the annual emissions were calculated based on assumed or modelled activity data such as distance, weight, and purchase cost.

6. Business travel: Even though most of our employees work locally at their respective sites, employees working in marketing, sales, and management regularly travel between sites as part of their work. Travel is mainly carried out by air, though travel by rail, ferry, taxi, rideshare, and in private vehicles do occur as well. Occasionally, employees are provided accommodation in hotels for longer business trips.

Data on business travel is still being collected, as it requires the input from, not only the accounting departments in each country, but also the travelling employees themselves for further details. In the meantime, we have used previously collected data from our environmental specialist, who have reported on business travel at specific sites for many years as part of our ISO 14001 certification. However, this data has mainly been focused on air travel with its large emissions of GHG's. Thus, we expect to add significant volumes of additional activity data from other transportation modes in the coming years.

3.7 Emission factors

One of the most important features of ALS NE's GHG inventory is its ability to assign supplier-specific emission factors for individual fiscal years to each emission source. This feature allows us to always use the most recent and accurate emission factors and to avoid the use of outdated emission factors. The latter is especially relevant for calculation of location-based electricity emissions, because the Nordic grid-average emission factor generally decreases each year due to a higher share of the electricity mix being from renewable sources.

The emission factors used for our GHG calculations originate from a variety of sources including national agencies, scientific studies, the GHG Protocol, product and service suppliers, and the ecoinvent life cycle inventory database (version 3.8). The ecoinvent database contains data sets of more than 18,000 activities and allows users to calculate specific emission factors using their preferred impact assessment method. ALS NE uses the unit-regionalized variation of the database with the cut-off system model and the impact assessment method IPCC 2013 GWP 100a.

When choosing which emission factor to use for a given emission source, we have evaluated the potential factors based on accuracy and relevance, and then chosen the emission factor most likely to minimize the uncertainty of the calculation. Occasionally it has been necessary to convert original emission factors into other units before multiplying them with their corresponding activity data. In these cases, the conversions are carried out directly in the GHG inventory's emission factor database.

It is ALS NE's intention to continuously review and update emission factors while registering all significant changes to the factors for inventory recalculation purposes (cf. section 3.2.1).

3.8 Exclusions

Sections 3.6.1 – 3.6.3 of this report describe the emission sources included in the current inventory, and while most of our main emission sources in scopes 1 and 2 are accounted for, some additional smaller emission sources have also been identified and then deliberately excluded from the inventory.

For scope 1 and 2 we have excluded emissions from:

- Smaller rented sample drop-off locations, parking lots, and storage spaces.
- Fuel consumption in lawn mowers and other small equipment used to maintain sites.
- Gasses emitted to the atmosphere during analysis carried out in the laboratory.

The above emissions are expected to be insignificant compared to the quantified emissions, and/or will be difficult to measure or estimate. However, as our work with GHG data collection improves, we expect to be able to either include all of the above emission sources in our inventory, or to be able to quantify the emissions sufficiently to exclude them on a stated significance level, e.g. <1% of our total emissions.

Due to the large extent of scope 3, we are not yet including emissions from all fifteen scope 3 categories in our inventory. It is however our intent to continuously work to add emission sources from additional (relevant) categories to obtain a complete picture of our value chain emissions. The following scope 3 emission sources have so far been deliberately excluded, even though they belong in the categories described in section 3.6.3:

- All emissions from the Landskrona and Sollentuna pharmaceutical sites.
- Emissions from specialized plastic material used in membranes such as silicone, foam, and PTFE.
- The emissions from production of gas mixtures occasionally used in the laboratories.
- External logistic services used to transport other internal goods than samples and sample containers, e.g. equipment, office supplies, and documents.
- Emissions from business travel by rental car and from hotel accommodations.

The main reason for the exclusions above has been that it was not technically possible or highly resource demanding to quantify these emissions at the present time. However, we are continuously working on improving this area and aim to include most, if not all, of the identified scope 3 emissions in the inventory in the long run.

3.9 Uncertainty

Many different types of uncertainties are associated with the compiling of a GHG inventory – from the uncertainty of the obtained activity data itself (both measured, calculated, and estimated) to the uncertainty of the emission factors used to calculate the GHG emissions. The significant uncertainty associated with GHG inventories is mainly due to the complicated nature of GHG accounting, which combines the fields of financial reporting, data management, and climate science. It is generally accepted that while the individual uncertainty of activity data, emissions factors, etc. should always be minimized, the general uncertainty of the inventory can never be completely eliminated.

When collecting activity data for the various emissions sources, we have used the following approximate scale to evaluate the uncertainty associated with the data:

- **Low uncertainty:** Measured consumption data or emissions data delivered directly by reliable suppliers with sufficiently documented sources and methodology. Emissions data is preferably in kg CO_2 or kg CO_2e per unit or time period. Examples include electricity consumption and reported emissions from subcontracted transportation companies.
- **Medium uncertainty:** Data estimated using supplier-provided calculation tools, or activity data calculated on a combination of directly supplier-provided values (e.g. distance) and self-estimated values such as average shipment weights. It also includes activity or emissions data estimated from purchase cost using index values calculated from other suppliers. Data can be in various different units, examples include transport distances from invoices and amounts of consumed plastics from a given supplier.
- **High uncertainty:** Activity data for input into the GHG inventory is directly or indirectly estimated from other types of activity data using generally estimated values. Data can be in any unit. Examples include district heating data estimated from floor areas, values of tonne kilometres calculated from both estimated distances and weights, and emissions estimated from purchase cost using calculated index values from other countries.

The activity data for most of the emission sources included in scopes 1 and 2 has been evaluated as having low uncertainty. Medium and high uncertainties are generally seen for activity data in scope 3, especially for some of our minor external logistics service providers for which very little information is available.

The uncertainty related to our applied emission factors is not evaluated individually. Instead, it is included in the considerations when selecting the factors themselves for the inventory. We aim to use the most representative emission factors regarding geography, time, and circumstances. For this reason, we have chosen to use supplier-provided (and quality assured) emission factors, when possible, as we expect our suppliers to be the best-informed on the production or generation of their products. If suppliers are not able to provide us with applicable emission factors, we will prefer local over national values, current over outdated values, and product-specific over generic values. We use the Ecoinvent database (cf. section 3.7) to obtain emission factors for the times when a default or approximate value is acceptable due to a lack of better options.

4. Results

This section presents and discusses the development in emissions in all three scopes from the base year (FY 2020) to the current reporting period (FY 2022). Due to the large difference in completeness of the collected data for scope 3 compared to scopes 1 and 2, this scope is addressed separately in section 4.2.

In addition to the change in individual emission categories discussed in sections 4.1 to 4.3, section 4.4 looks at the collective emissions for each of the four countries included in ALS NE. Local differences at the sites have greatly affected the size of their emissions as well as their potential to reduce them since FY 2020. This point is further illustrated in section 4.5.1, which presents normalized metrics (ratio indicators) for each country by relating the total scopes 1 and 2 emissions to site-specific sample numbers, number of worked hours, and net revenue (SEK).

4.1 Scopes 1 and 2 emissions

Table 4.1 contains the total emissions in scopes 1 and 2 for all eight Nordic sites in the recently completed fiscal year of 2022 and in the two previous fiscal years including the base year. As stated in section 3.4.1, scope 2 and total emissions are reported using both the market- and the location-based calculation methods.

Table 4.1 – Scopes 1 and 2 emissions by category for all Nordic sites, FY 2020 – FY 2022. Emissions are in t CO_2e.

	FY 2022	FY 2021	FY 2020
Scope 1 emissions	**380.6**	**423.3**	**363.2**
Stationary combustion	97.0	95.7	87.1
Mobile combustion	281.9	326.1	275.5
Fugitive emissions	1.7	1.5	0.7
Scope 2 emissions (*market-based*)	**26.3**	**299.4**	**336.5**
Electricity	21.2	295.0	332.6
Heating, cooling, and steam	5.1	4.3	3.9
Scope 2 emissions (*location-based*)	**1,335.8**	**1,283.6**	**1,195.0**
Electricity	1,241.9	1,201.5	1,121.8
Heating, cooling, and steam	93.9	82.1	73.1
Total emissions (*market-based*)	**406.9**	**722.7**	**699.7**
Total emissions (*location-based*)	**1,716.4**	**1,706.9**	**1,558.2**

When looking isolated at the total emissions, a clear downward trend can be seen for the market-based emissions, while the location-based emissions have been increasing since the base year. Results for the individual categories are discussed in detail in the next two subsections.

4.1.1 Scope 1 emissions

The emissions from **stationary combustion** (natural gas) have continued to increase in FY 2022, though not as much as from FY 2020 to FY 2021. Due to a lack of available data, the emissions from January to

March 2022 (corresponding to approximately 44 t CO_2e) have been estimated from the gas consumption in the same period the year before. Thus, the emissions for stationary combustion in FY 2022 will need to be recalculated in the next reporting period, when actual data has been received from the supplier. Because the Humlebæk site, which is the only one using natural gas, has seen an overall increase in production since the base year, it is not surprising that its consumption of gas has increased as well.

While the emissions from **mobile combustion** increased significantly from FY 2020 to FY 2021, they returned to the base year level in FY 2022. The reason for the large increase in this category in FY 2021 is to be found in the purchase of petrol and diesel at the Danderyd site, which increased from 6,056 litres to 27,029 litres due to increased use of company vehicles for transportation purposes. This was at a time when our external logistic service providers were heavily affected by the COVID-19 pandemic. When electric vehicles were introduced into the Swedish vehicle fleet in FY 2022, fuel consumption fell to 11,264 litres with approximately 20% of the purchased diesel being HVO 100 biodiesel with lower emissions per litre than regular diesel. Together, the EVs and biodiesel reduced emissions from FY 2021 to FY 2022.

The **fugitive emissions** from leaks of refrigerants constitute less than 0.5% of the total scope 1 emissions in all three years, however, their relative importance is high, as the actual amounts of emitted refrigerants to the atmosphere are disproportionately low (from 0.9 kg in FY 2022 to 1.3 kg in FY 2021). This discrepancy is due to the high GWPs of the refrigerants in the atmosphere (cf. section 3.5). The risk of emitting large amounts of CO_2e from this category is therefore high, and effort should be made to eliminate all such leaks going forward. The increase in fugitive emissions from the base year is not seen as a general trend, but rather as the result of leaks of more potent refrigerants in later years.

4.1.2 Scope 2 emissions

The market-based indirect scope 2 emissions from purchased **electricity** have been significantly reduced in the last fiscal year with the current value corresponding to a 93.6% reduction from FY 2020. As can be seen from the overall increase in ALS NE's electricity consumption since the base year (cf. Figure 9.3), the reduction in emissions is not due to less energy being used. Rather, it is the result of the Nordic policy of procuring certified renewable (green) electricity at as many sites at possible. Currently, all sites except Sarpsborg and Helsinki are actively buying green energy from their suppliers with the main electricity source being Norwegian hydropower. The large drop in market-based emissions from electricity from FY 2021 to FY 2022 is almost exclusively the achievement of the Humlebæk site. The Danish site started buying certified renewable electricity in January 2021 and thereby reduced its emissions by more than 250 t CO_2e.

No significant change is seen for the market-based indirect scope 2 emissions from purchased **heating, cooling, and steam**, which may partly be due to the lack of activity data for three of the five sites buying heat externally (cf. section 3.6.2). The calculations carried out to estimate the heating consumption on these sites are based on a combination of static floor area values and data from other sites, which may not be sufficiently representative to accurately estimate the actual consumption. However, it is our overall expectation that the uncertainty of the calculated values has been reduced as far possible, and that the limited laboratory activities at these three sites would lead to a quite stable heating consumption.

ALS NE has chosen to report scope 2 emissions calculated both using the market-based and location-based methods (cf. Section 3.4.1), while focusing on the market-based approach in our inventory assessment and further emission reduction projects. The location-based scope 2 emissions have increased significantly since the base year with the largest increase happening between FY 2020 and FY 2021. As the emission factors used to calculate the location-based values are unchanged in the period (because no newer values have been published yet), it must be the result of an increase in consumption of either electricity or heating consumption. From FY 2020 to FY 2021, the heat consumption at the Luleå and Danderyd sites increased by 10% and 29%, respectively. Because the data from these two sites are used to estimate heat usage at three other sites (as described in Section 3.6.2), the total increase in consumption becomes even larger. However, as it can be seen from Table 4.1, this only affects the emissions in the category significantly when using the location-based calculation method.

4.2 Scope 3 emissions

Even though ALS NE is still working on collecting activity data for the many sources of indirect emissions in scope 3, we have so far managed to calculate emissions for selected sources in the scope 3 categories purchased goods and services, (upstream) transportation and distribution, and business travel. When collecting information in scope 3, we have initially focused on the emission sources expected to contribute most significantly to our total emissions.

Table 4.2 shows the scope 3 emissions that we have been able to quantify so far. Data on scope 3 emissions have only been collected for the environmental sites (cf. Table 3.1) due to data availability.

Table 4.2 – Scope 3 emissions by category for six Nordic sites, FY 2020 – FY 2022. Emissions are in t CO_2e.

	FY 2022	FY 2021	FY 2020
Upstream activities			
1. Purchased goods and services	**187.9**	**171.0**	**135.4**
Glassware	92.7	92.9	73.1
Plastics (PE, PET, PP, PS)	32.7	30.1	24.0
Gasses (Ar, CO_2, He, H_2, N_2, O_2)	62.5	48.0	38.3
4. Transportation and distribution	**287.3**	**265.8**	**246.6**
External logistics services	287.3	265.8	246.6
6. Business travel*	**1.5**	**2.8**	**9.8**
Air travel	1.3	2.6	9.4
Road travel (taxis and rideshares)	0.1	0.2	0.4
Rail travel	-	-	0.0
Total emissions	**476.7**	**439.6**	**391.8**

*Data not available for all sites and years.

In addition to expanding the category of purchased goods and services, we plan to include both "waste generated in operations" and "employee commuting" by the next reporting year. The next three subsections discuss the development in emissions for each of the three scope 3 categories included in Table 4.2

4.2.1 Purchased goods and services

The total emissions in this category increased by 38.8% from the base year to FY 2022, and while gasses saw the highest relative increase in the period (61.1%), both glassware and plastics emissions increased significantly as well, especially between FY 2020 and FY 2021. The relative increase in purchase volumes for the Humlebæk and Danderyd sites were approximately the same, however, the Humlebæk site generally uses more glassware and plastic as part of their laboratory operations and was responsible for 80% of the emission increases in these categories in FY 2021.

Of the purchased gasses in Danderyd, Luleå, and Humlebæk, the argon gas used for various metal analysis is without doubt the largest contributor of GHG emissions, because of the large volumes purchased. Table 4.2 shows an increase of 14.5 t of CO_2e from FY 2021 to FY 2022 for gasses. Most of this increase (12.7 t CO_2e) originated in Danderyd, however, it was not the result of increased consumption, but rather a change of gas supplier in the fall of 2021. Because no supplier-specific emission factors were available for the new supplier, it has been necessary to use default values for gas production that are considerably higher than the previously supplier-provided values. Thus, at least part of the increase in this category in FY 2022 may be an overestimation due to the change of supplier. It is therefore a priority for us to try to obtain more accurate emission factors from the new supplier going forward.

4.2.2 Transportation and distribution

Emissions from transportation of samples and sample containers provided by external logistics services have increased by approximately 20 t CO_2e per year since the base year with an overall increase of 16.5% from FY 2020 to FY 2022. However, we estimate that 20-30 t CO_2e is missing for the Oslo site in the base year due to missing invoice data (cf. Section 3.6). Thus, the actual increase from FY 2020 to today is more likely to be around 10-20 t CO_2e divided equally between the Danderyd, Humlebæk, and Oslo sites. In comparison, emissions from the Helsinki office site have decreased by 4.7 t CO_2e (13.1%) since FY 2020.

Aside from the missing Norwegian data for the base year, this scope 3 emissions category is almost completely quantified. Future work will therefore focus on improving data accuracy by obtaining additional information from suppliers for whom we currently estimate emissions rather than receive actual numbers.

4.2.3 Business travel

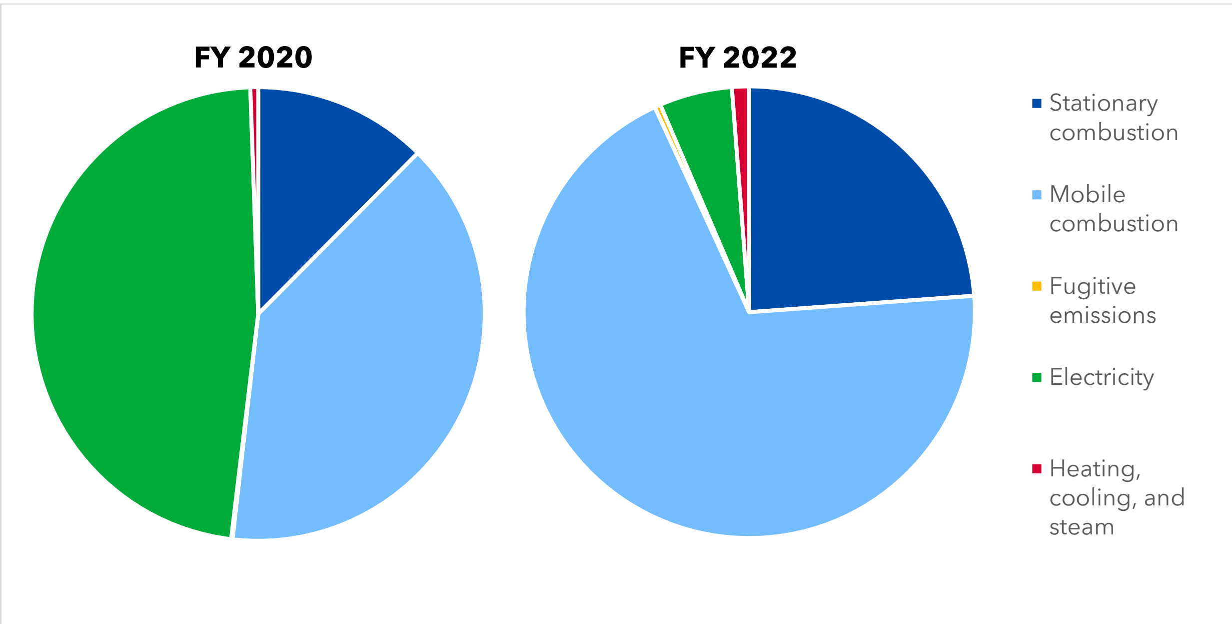
The emissions data for business travel in Table 4.2 is not complete but do contain most of the air travel carried out for the environmental sites in all three fiscal years. Missing data will therefore primarily be from travel by train, ferry, and taxi/rideshare, which are not expected to contribute significantly compared to air travel, as emission factors for (electric) trains in Scandinavia are generally low, and because the distances travelled by ferry and road are relatively short.

Table 4.2 clearly shows how business travel decreased in FY 2021 and FY 2022 due to the COVID-19 pandemic. The emissions from air travel in FY 2022 come from the Nordic management meeting held in Stockholm in March 2022, i.e. after most of the COVID-19 restrictions in Scandinavia were lifted. Business travel emissions are expected to return to the base year level in coming years, though some reductions might be seen due to increased use of online meetings

4.3 Emission categories

Figure 4.1 shows the composition of our total scopes 1 and 2 emissions in the fiscal years of 2020 and 2022 divided into categories. No significant change is seen for emissions related to leaks of refrigerants (fugitive emissions) or generation of heating, cooling, and steam – both categories continue to contribute less than 2% of the total emissions. Emissions from stationary combustion (natural gas combustion) constituted 12% of the total emissions in FY 2020 but have increased to 24% in FY 2022. Similarly, the share of emissions from mobile combustion (fuels used in company vehicles) has increased from 39% to 69% in FY 2022.

Figure 4.1 – Scopes 1 and 2 emissions, all sites, FY 2020 and FY 2022.



While emissions from both natural gas and fuels increased from the base year to FY 2022 (with 11.4 and 2.3%, respectively), their increased share of the total emissions is mainly due to the large decrease in emissions from electricity. In FY 2020, emissions from electricity generation constituted almost half (48%) of the total emissions in scopes 1 and 2. In FY 2022, this number had been reduced to 5%, as electricity emissions fell by 93.6% from the base year.

The large change in emissions composition in just three fiscal years is the result of ALS NE's focus on reducing emissions by purchasing renewable electricity. The remaining electricity emissions originate from the sites in Helsinki and Sarpsborg, and from the external charging of EVs in Sweden. It is clear from the development illustrated in Figure 4.1 that the reduction potential is currently greatest in the categories of stationary and mobile combustion. Projects have already commenced to reduce emissions in these areas (cf. Section 5.1), for example the replacement of heating with natural gas by district heating in Humlebæk, and a partial transition from regular diesel to the less CO_2-intensive biodiesel (HVO 100) for our Danish vehicle fleet.

4.4 Emissions per country

ALS NE currently encompasses eight different locations/sites in four different countries, and while our long-term goal of becoming climate neutral is based on our total emissions in Northern Europe, it makes sense to assess the sites individually to identify trends and track reductions. Table 4.3 shows our total emissions in scopes 1 and 2 by site and country for the base year and latest fiscal year of FY 2022 as well as the absolute changes in emissions for each site and country.

Table 4.3 – Scope 1 and 2 emissions by site, FY 2020 and FY2022. Emissions are in t CO_2e.

	FY 2022	FY 2020	Change
Sweden	**41.1**	**21.5**	**+19.6**
Danderyd	39.1	18.1	+21.0
Luleå	0.0	0.0	-
Sollentuna	1.9	1.9	-
Landskrona	0.0	1.4	-1.4
Norway	**12.2**	**11.6**	**+0.8**
Oslo	2.0	-*	-
Sarpsborg	11.6	10.2	**+1.4**
Denmark	**349.0**	**662.4**	**-313.4**
Humlebæk	349.0	662.4	-313.4
Finland	**4.6**	**4.2**	**+0.4**
Helsinki	4.6	4.2	+0.4
Total emissions (*market-based*)	**406.9**	**699.7**	**-292.6**

*Data not available, cf. section 3.6.

The sections below discuss the emissions in Table 4.3 for each of the four Nordic countries with ALS NE sites.

4.4.1 Sweden

The total emissions for the Swedish sites in FY 2022 are approximately twice as high as in the base year due to a significant increase in the emissions from the Danderyd laboratory site. Emissions in Luleå and Sollentuna are unchanged, while a small decrease is seen in Landskrona, where the fuel purchased in the base year is no longer relevant to the business in FY 2022.

In Danderyd, the increased emissions are partly because of an increase in fuel consumption as illustrated by Figure 9.2 (+9.0 t CO_2e), and partly because of the newly added emission source that is purchased electricity for charging of electric vehicles (+11.6 t CO_2e). Unfortunately, suppliers of electricity for EV charging do not all offer the option to purchase renewable electricity, and logistics considerations have led to the need to charge at multiple suppliers. The increased consumption of fuel is primarily petrol, however, some emission savings can also be found in this category, as the replacement of regular diesel with HVO 100 biodiesel has contributed to a reduction of approximately 4 t CO_2e in both FY 2021 and FY 2022.

4.4.2 Norway

Due to a lack of activity data for the Oslo site in FY 2020, it has not been possible to calculate base year emissions for this specific site. However, as the site has not had any scope 2 emissions from electricity and heating since its latest relocation in 2017, the only potential emission source is fuel. The consumption of fuel in the base year is not expected to be significantly different from in the following two fiscal years, which corresponded to 2.5 and 2.0 t CO_2e, respectively. The change in emissions from the Oslo site from the base year to FY 2022 is therefore assumed to be less than 1 t CO_2e in either direction.

The Sarpsborg site has seen a decrease in emissions primarily from a lower electricity consumption (cf. Figure 9.3). It is one of the few Nordic sites that is not currently purchasing renewable electricity, however, as it is gradually being shut down (with expected final closing in 2025), emissions from electricity are expected to continuously decrease in the coming years.

4.4.3 Denmark

While the Danish site in Humlebæk is still the main contributor of scopes 1 and 2 emissions in FY22, it has managed to almost halve its emissions compared to the base year (a decrease of 47.3%). This decrease is mainly the result of the site switching to renewable electricity in January 2021, but lowered emissions from fuel consumption have also contributed to the overall reduction by 5.7 t CO_2e. Two thirds of this reduction can be found in a reduced fuel consumption in FY 2022 compared to the base year (cf. Figure 9.2), while the last third comes from the initiation of a reduction project implemented in March 2022. The project aims to partly transition to HVO 100 biodiesel in the Danish vehicles with an expected emissions savings of 46 t of CO_2e (cf. chapter 5).

In addition to the reduced emissions from fuel and electricity, the Humlebæk site has also seen a small increase in emissions from leaking refrigerants (1 t CO_2e) and increased natural gas consumption (cf. Figure 9.1), though it should be mentioned that the latter value is partly estimated and might be adjusted by the next fiscal year.

4.4.4 Finland

The emissions for the office site in Helsinki, Finland, have increased by 0.4 t CO_2e (9.5%) since the base year. As the change is due to an increase in estimated heating consumption, it is too uncertain to conclude on. Generally, the fluctuations in scopes 2 emissions for the site are quite small, as the office site is less affected by changes in production volume than the larger laboratory sites in the other countries.

4.5 Total emissions

Figure 4.2 combines the results of the previous sections to illustrate the total emissions of all sites from FY 2020 to FY 2022 broken down by scope. It should be noted that the included scope 3 emissions are still far from fully accounted for and are expected to increase, as more emission sources are identified and quantified.

ALS NE's total emissions increased by 7.2% from FY 2020 to FY 2021, and then fell to 81.6% of the base year level in FY 2022. Besides a small increase in FY 2021, the total scope 1 emissions have not changed significantly compared to the scope 2 emissions, which decreased drastically in the same period. Scope 3 emissions have increased steadily since the base year and are now by far the largest of the three scopes. This is in accordance with our expectations going into the GHG area, and in the future this difference between the scopes will only increase, as more emission sources in scope 3 are identified and quantified. However, the potential for reducing emissions in scope 3 is also large, which will be evident in the coming years with our focus on involving our employees in our work to reduce emissions as described in chapter 5.

Figure 4.2 – Total quantified emissions, all sites, FY 2020 – FY 2022.

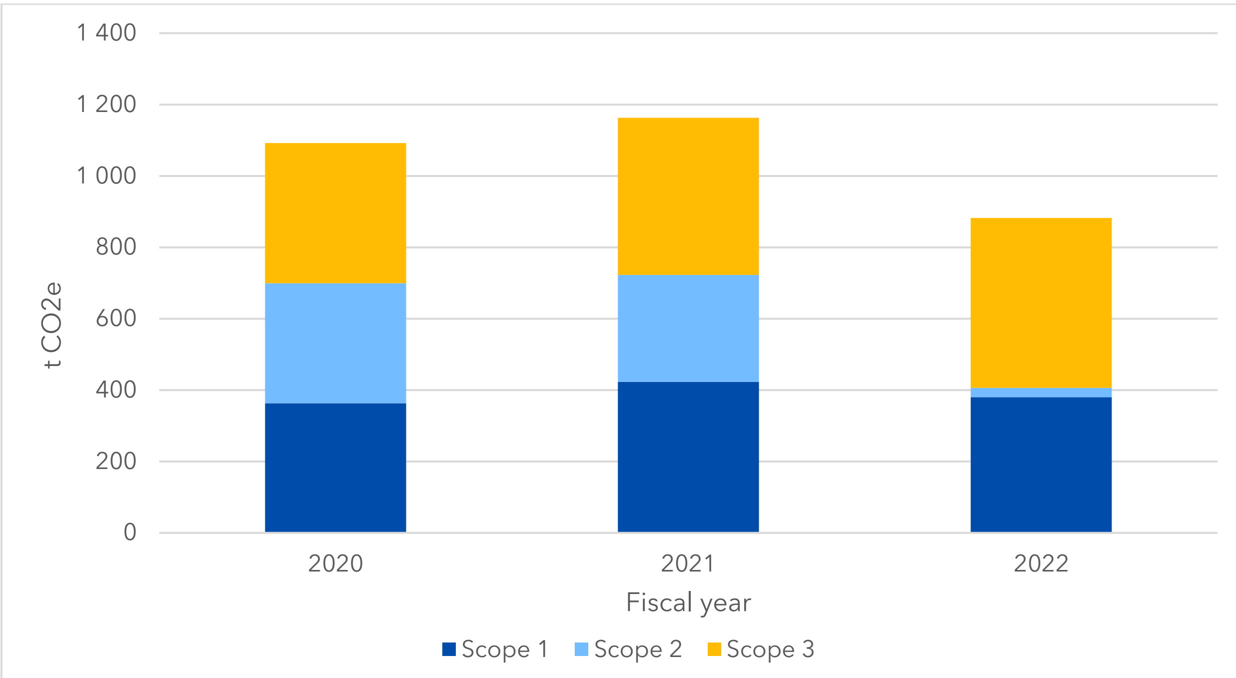
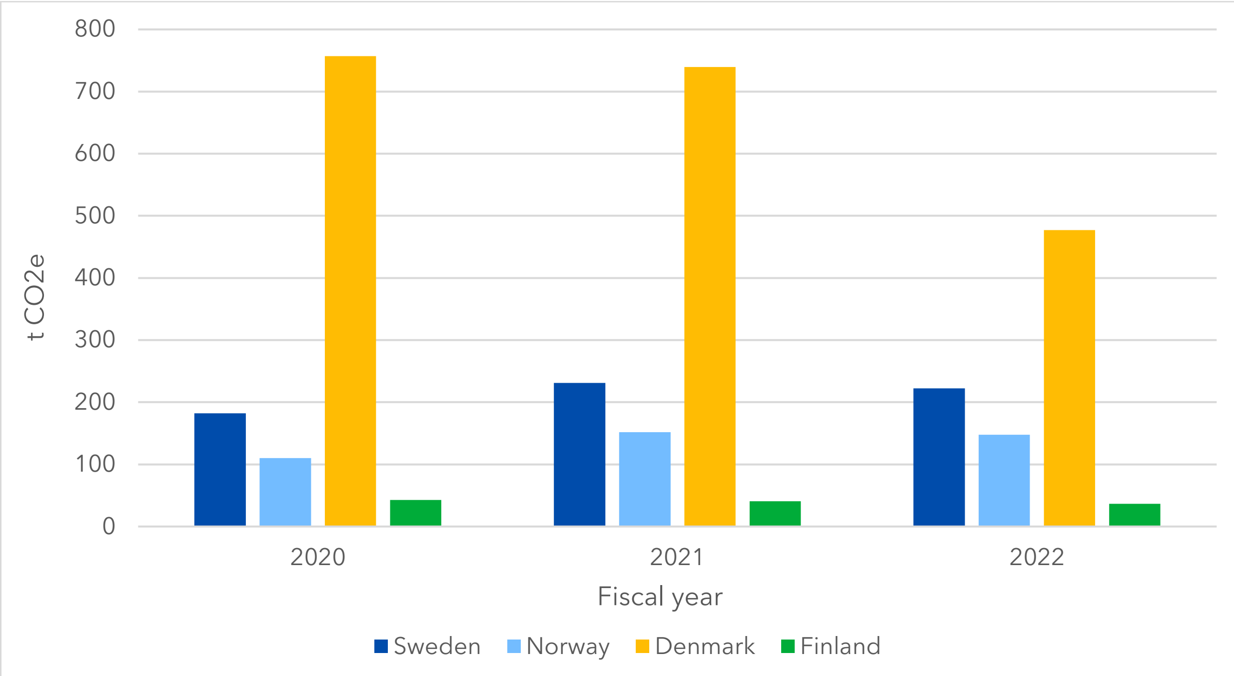


Figure 4.3 shows the total emissions from Figure 4.2 divided into the four countries represented in ALS NE. Once again, this figure clearly shows that Denmark is the main contributor of emissions in the Nordic Region with the large drop from FY 2021 to FY 2022 being the scope 2 reduction seen in Figure 4.2 as well. Second to Denmark in emissions are the collected Swedish sites, which mainly consist of emissions from the Danderyd laboratory. What Figure 4.3 does not show is the substantial reduction from FY 2021 to FY 2022, when Danderyd started using electric vehicles as part of their operations. These savings are masked by the increase in scope 3 emissions from purchased goods and services (cf. section 4.2.1). A small increase is seen for Norway, which is mainly due to increased scope 3 emissions from external logistics services, though this category is underestimated for the base year (cf. section 4.2.3). Approximately 10 t of CO_2e are still emitted annually from the Sarpsborg site due to its electricity consumption, however, these emissions should be eliminated in the coming years, as the site moves towards closing by 2025. No significant scope 3 emissions have so far been quantified for Finland, which means that the emissions shown in Figure 4.3 are solely emissions from electricity and heat in scope 2. As the energy consumption in the Helsinki office does not change much from year to year, the associated emissions have similarly been stable from the base year to FY 2022.

Figure 4.3 – Total quantified emissions per country, FY 2020 – FY 2022.



4.5.1 Ratio indicators

ALS NE has experienced general growth in its operations since the base year FY 2020, which can be seen in the increased consumption of energy (natural gas, fuel, electricity) shown by Figures 9.1-9.3, and in the increased emissions from purchase of goods and services in Table 4.2. To better be able to compare emissions from year to year, we have chosen to calculate a range of so-called ratio indicators meant to decouple emissions from production. The indicators (emissions per sample, hour worked, and net revenue) are all in some way related to production and expected to roughly follow the same trend at the respective sites.

Table 4.4 contains the calculated values of three different ratio indicators for each site in the recently completed fiscal year of 2022. Only scopes 1 and 2 emissions have been used to calculate the values in the table, which means that sites without or only few quantified scope 3 emission sources have low or no emissions per metric.

Table 4.4 – Ratio indicators per site/country, scopes 1 and 2, FY 2022. Emissions are in kg CO_2e.

	Per sample	Per hour worked	Per 1,000 SEK (net revenue)
Sweden			
Danderyd	0.27	0.28	0.25
Luleå	0.00	0.00	0.00
Sollentuna	0.09	0.05	0.06
Landskrona	0.00	0.00	0.00
Norway			
Oslo	0.02	0.03	0.04
Sarpsborg	-	-	0.87
Denmark			
Humlebæk	1.33	2.28	2.69
Finland			
Helsinki	0.21	0.18	0.29
Average	**0.27**	**0.40**	**0.53**

The values in Table 4.4 confirm the trends and tendencies seen previously in this chapter with Humlebæk and Danderyd being the main emitters, though Helsinki is actually at the same level as Danderyd due to their low production volume.

While the calculated ratio indicators in the table are interesting, they will not be very useful for comparisons between the individual sites and fiscal years before more scope 3 emission data has been collected in the coming years. At that time the ratios should allow us to both track our progress in reducing emissions, but also communicate to clients the amount of GHG emissions associated with their specific sample. This is one of the milestones we hope to achieve on our journey towards climate neutrality.

5. Reducing emissions

As an analysis company it is natural for us to want to first measure (emissions), and then to improve (reduce). However, climate change is already impacting communities around the world, and urgent action is needed to keep global warming well below 2 °C by 2050 as outlined in the Paris Agreement. For this reason, we have focused on identifying and implementing projects to reduce emissions, while simultaneously working on compiling a complete GHG inventory. This section briefly describes our approach to reducing GHG emissions with examples of completed, ongoing, and future projects. It should be noted that emission reductions have been carried out in the past as well with many of the Nordic sites purchasing certified renewable electricity prior to our inventory base year of FY 2020.

5.1 GHG reduction projects

ALS NE continuously encourage employees to suggest potential ways for us to reduce our emissions going forward. GHG reduction projects might consist of investments in new technology or capital goods, changes in procurement practices, or adjusted workflows at the individual sites. When a project with the potential to reduce GHG emissions has been identified, the Nordic GHG Emissions Controller then calculates the estimated reductions. These calculations, along with the financial aspects, help the relevant site manager(s) to decide whether to carry out the project or not. As the calculated reductions will be based on current data and assumptions, it is important to re-evaluate projects and update calculations regularly as new and more accurate information becomes available.

Table 5.1 lists examples of GHG reduction projects carried out or initiated from FY 2021 and onwards.

Table 5.1 – Completed and commenced reduction projects, scopes 1 and 2, FY 2021 – FY 2023.

Project	Project start	Description	Est. CO_2e reduction/year
Electric vehicles	FY 2022	Acquisition of 6 EVs to collect samples and carry out sample transportation between the Nordic sites in Norway, Sweden, and Denmark.	42 t
HVO 100	FY 2023	Partial transition to biodiesel (HVO 100) in company vehicles in our Danish vehicle fleet.	46 t
Green electricity	FY 2021	Purchase of certified renewable electricity at our Humlebæk laboratory site.	350 t
Solar panels	FY 2023	Installation of solar panels on the roof of the Landskrona site.	0 t*

*As the Landskrona site is already purchasing certified renewable electricity, the energy generated by their new solar panels will not result in any reductions when calculating emissions using the market-based method.

While the primary focus of reduction projects so far has been emissions sources in scopes 1 and 2, the last fiscal year (FY 2022) has introduced multiple projects related to scope 3 – even in categories that have not yet been fully quantified in the GHG inventory. Such projects include changes to disposal practices for analysis waste, solvent volume optimizing for organic extractions, and implementation of new analyses at local ALS laboratories to reduce the need for external logistics services for transportation of samples.

The reductions associated with these scope 3 projects have generally not been very high compared to our total emissions (a few hundred kilos or tons per year). However, these projects often contribute to our general sustainability goals as well as reduce GHG emissions, and they send a strong signal to employees that their ideas and efforts are appreciated. Scope 3 projects are therefore valued in line with those in scopes 1 and 2.

Several reduction projects from all scopes have already been planned and/or initiated for the current fiscal year (FY 2023). Examples of such projects are listed in Table 5.2 below:

Table 5.2 – Planned and commenced reduction projects, all scopes, FY 2023.

Project	Project start	Description	Est. CO_2e reduction/year
Green electricity	FY 2023	Purchase of certified renewable electricity at the Helsinki office site in Finland.	2 t
Digital signatures	FY 2023	Elimination of paper reports for analytical results at the Sollentuna site.	4 t
District heating	FY 2023	Transition from natural gas to district heating at the Danish laboratory site in Humlebæk.	40 t

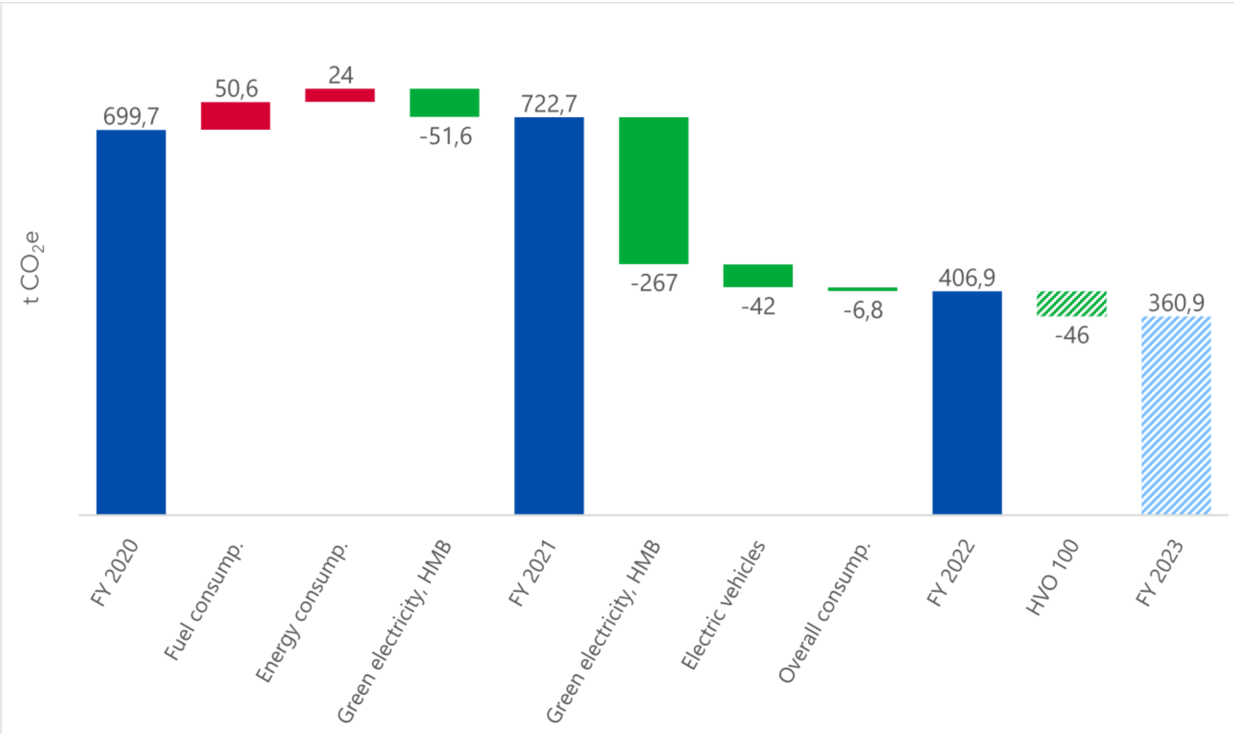
5.1.1 Reduction impact

Figure 5.1 on the next page illustrates the impact of selected completed and ongoing reduction projects on our total scopes 1 and 2 emissions from FY 2020 to FY 2023. The purchase of renewable electricity at the Humlebæk (HMB) site began in January 2021 corresponding to three months of zero emissions from electricity in FY 2021. This reduction (-51.6 t CO_2e) almost exactly compensated for the emissions from increased fuel consumptions in FY 2021 (+50.6 t CO_2e).

Multiple reduction projects were launched or continued in FY 2022, which saw a large decrease (>300 t CO_2e) in emissions from the previous fiscal year. Figure 5.1 clearly shows the continued effect from purchasing green electricity in Humlebæk (-267 t CO_2e) as well as the reductions from using electric vehicles instead of fuel vehicles in Sweden (-42 CO_2e).

One of the major reduction projects in the current fiscal year (FY 2023) will be the partial transition from regular diesel to biodiesel (HVO 100) in our Danish vehicle fleet. The project is estimated to save the site approximately 46 t of CO_2e in FY 2023. Another project that is expected to reduce our emissions significantly is the change of heating source from natural gas to district heating at the Humlebæk site, however, it is currently uncertain when the project can be started. The estimated reduction of approximately 40 t of CO_2e per year might therefore not be realized until FY 2024.

Figure 5.1 – Actual and estimated emission reductions from future projects, scopes 1 and 2. Shaded areas are estimated values.



6. Carbon offsetting

For the past three years, ALS NE has been climate compensating through the United Nations' Clean Development Mechanism (CDM) program. Under the CDM program, GHG emission-reducing or -limiting projects can be carried out in developing countries with the financial support of countries, organizations, or businesses from around the world. The projects focus on sustainable development and real emission reductions that are converted into certified emission reduction (CER) credits (or offsets). Each credit is equivalent to a single ton of CO_2e, which can be sold to companies or countries that want to count these credits towards their own emission reduction targets while supporting sustainable development around the world.

By offsetting part of our total GHG emissions using purchased CERs, ALS NE is continuing to take climate action and work seriously towards our goal of climate neutrality by 2035. While we are currently working on identifying and implementing a range of difference reduction projects across the Nordic region (as described in Chapter 5), the real emission reductions of these projects will not be enough for us to reach neutrality. Because of the technological limitations to eliminating emissions completely, it will be necessary for us to compensate for our remaining emissions by obtaining CERs. Carbon offsetting has been part of our climate neutrality plan from the beginning, which is why we first purchased credits in FY 2020 and have been doing it every fiscal year since. This approach has allowed us to simultaneously work on reducing our own emissions, while at the same time supporting efforts to reduce emissions in other parts of the world.

6.1 Angkor Bio Cogen Rice Husk Power Project

ALS NE has chosen to invest in the CDM program no. 0363: Angkor Bio Cogen Rice Husk Power Project. The project is the first renewable energy project to utilize rice husk as biomass fuel for electricity generation in Cambodia, and it involves the operation of a new 2 MW rice husk power generation plant in the Kandal province. We have invested in this project in all three of our years of climate-compensating with an increasing number of purchased CERs each year (see Table 6.1).

Table 6.1 – Purchased CERs, FY 2020 – FY 2022.

Fiscal year	Project	CERs (t CO_2e)	Total emissions* (t CO_2e)
2020	Angkor Bio Cogen Rice Husk Power Project	450	1,081.7
2021	Angkor Bio Cogen Rice Husk Power Project	600	1,159.5
2022	Angkor Bio Cogen Rice Husk Power Project	775	883.1

*Including currently quantified scope 3 emissions as defined in Section 3.6.3.

6.1.1 Project description

The Angkor Bio Cogen Rice Husk Power Project includes both a GHG emissions reducing aspect and a sustainability aspect. In short, the emissions reduction is achieved by collecting rice husk that was previously left to decay in the open rice fields, where it produced the greenhouse gas methane during its decomposition process. The GWP value of methane, CH_4, is 28 (IPCC, AR5), which means that a single kilo of emitted methane corresponds to the emission of 28 kg of CO_2.

The collected rice husk is used to generate renewable electricity for use at a local rice mill that would otherwise use diesel oil to generate electricity. Surplus electricity from the biomass power plant goes to neighbouring businesses and the local community, whose reliance on diesel oil and batteries for power is now greatly decreased. The Angkor project has contributed to the improvement of the community's economic, social, and environmental wellbeing by providing a reliable electricity supply for the rice mill, while at the same time reducing emissions of methane and GHGs produced by the burning of diesel.

6.2 Future carbon offsetting

ALS NE intends to continue purchasing certified carbon credits in the future, though it might be done as part of a centralized GHG strategy from our parent company, ALS Limited. In previous years, management has purchased credits at the end of each calendar year based on rough estimations of emissions generated from transportation of samples – both from clients and between our individual laboratories. Table 6.2 compares the amount of purchased CERs with the actual transportation emissions presented in this report. Since FY 2021, we have managed to compensate for our transportation emissions through carbon offsetting, and in FY 2022 we purchased an additional 197 t of CERs, which have gone to offset some of our non-transportation related emissions.

Table 6.2 – Purchased CERs and transportation emissions, FY 2020 – FY 2022.

Fiscal year	CERs (t CO_2e)	Transportation emissions (t CO_2e)*	% covered by CERs
2020	450	522.1	86.2
2021	600	591.9	101.4
2022	775	578.2	134.0

*Includes emissions from mobile combustion (scope 1), and external logistics services (scope 3) as well as electricity emissions from Swedish EV charging in FY 2022 (scope 2).

7. References

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8. Appendices

This section contains data and graphs referred to in the main report.

8.1 Consumption data

The scopes 1 and 2 emissions presented in Section 4.1 are calculated based on the consumption of natural gas, fuel, and electricity. The activity data for these emission sources are illustrated below.

Figure 9.1 – Natural gas consumption, FY 2020 – FY 2022. Shaded values for indicate estimated consumption.

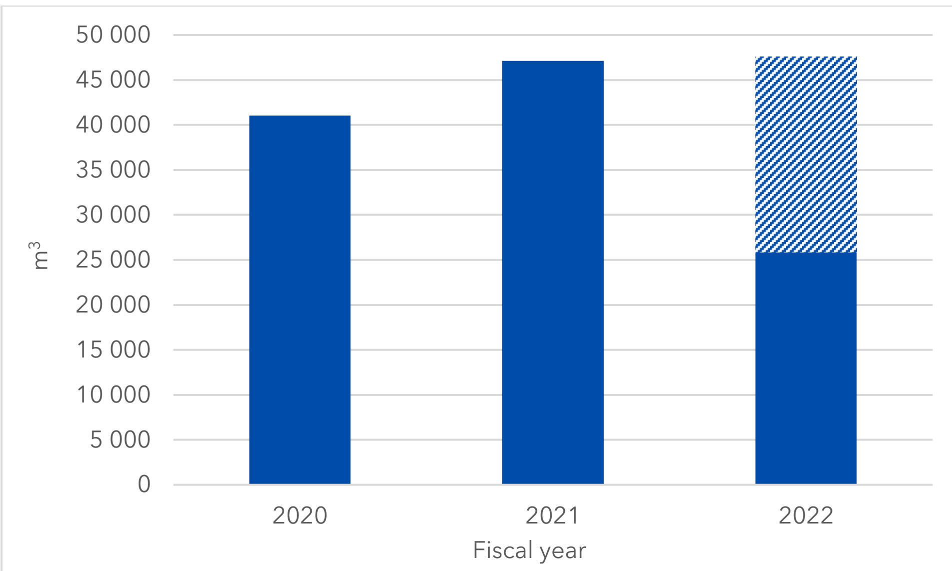

Figure 9.2 – Fuel consumption (petrol, diesel, HVO 100), FY 2020 – FY 2022.

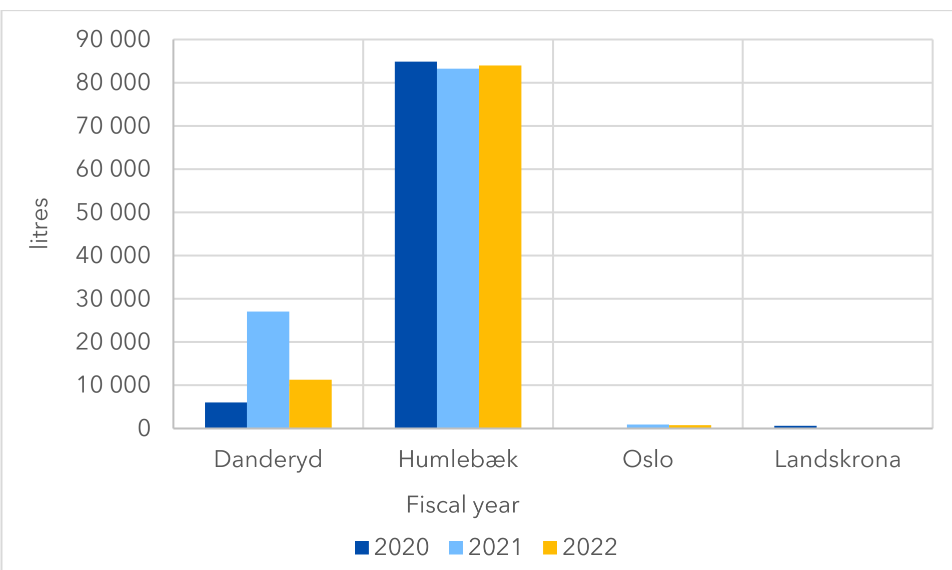

Figure 9.3 – Electricity consumption, FY 2020 – FY 2022.