

# Master thesis

## On the direct comparability of non-financial reports from a “Climate Action” & emissions perspective

- with specific reference to Large Cap companies on the Swedish Stock Market over a ten year period

**MID SWEDEN UNIVERSITY**

Department of Business, Economics and Law

*Examiner: Heléne Lundberg*

*Supervisor: Olof Wahlberg*

*Author: Frances Clarke Hermansson, fch@telia.com*

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**Mittuniversitetet**

MID SWEDEN UNIVERSITY

Campus Härnösand Universitetsbacken 1, SE-871 88. Campus Sundsvall Holmgatan 10, SE-851 70 Sundsvall.

Campus Östersund Kunskapens väg 8, SE-831 25 Östersund.

Phone: +46 (0)771 97 50 00, Fax: +46 (0)771 97 50 01.

## **ABSTRACT**

There are problems connected to the non-financial reports (NFRs) prepared by companies. The purpose of this study is to compare over a ten year period, the NFRs of Large Cap companies on the Swedish Stock Market, from a “Climate Action” and emissions perspective, to determine if the direct comparability of NFRs has increased within companies, if the direct comparability of NFRs between companies has increased and if regulations launched during the past decade have increased the direct comparability of NFRs.

The non-financial reports (NFRs) of twenty four different Large Cap companies on the Swedish Stock Market were studied from 2010 to 2019 using a semi-inductive approach. A Research model and an Analysis model, the latter containing four components, frameworks, indicators, units of measurement and physical quantities, was developed in this study and its components used for analytical purposes.

The results of the study show that only four enterprises’ NFRs, out of a total of twenty-four, could be compared internally for climate change issues over the entire decade. Furthermore, none of the companies’ NFRs could be directly compared between companies within this timeframe. The study has shown that direct comparability of NFRs, both within and between companies over time, requires that a unit of measurement and a physical quantity are used consistently by the companies.

This study indicates that neither direct internal comparability of NFRs nor direct comparability between companies’ NFRs, have increased within and between companies over a decade. Despite the introduction of regulations there has not been a uniformity of procedures of the companies’ combined use of units of measurement and physical quantities which allows for individual interpretation of their contents.

A suggested future research project is to lay the foundation for a combined financial and non-financial report where issues of risk and responsibility are tackled.

**Keywords:** Non-financial report (NFR), comparability, sustainability, framework, indicator, unit of measurement, physical quantity, CO<sub>2</sub>e, GHG emissions.

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Frances Clarke Hermansson  
fch@telia.com

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**Abbreviations**

3PL – third party logistics

CDP – Carbon Disclosure Project

C – Carbon

CO<sub>2</sub> – Carbon dioxide

CO<sub>2</sub>e – Carbon dioxide equivalent

EU - European Union

GHG – Greenhouse gases

GRI – Global reporting initiative

GWP – Global warming potential

NFR – non-financial report

NYSE – New York Stock Exchange

OECD - Organization for Economic Co-operation and Development

SME – Small and medium sized enterprises

UNFCCC – United Nations Framework Convention on Climate Change

UNGC – United Nations Global Compact

UNSDG - United Nations Sustainable Development Goals

WRI – World Resources Institute

WBCSD – World Business Council for Sustainable Development



# 1. Introduction

## 1.1 Background

Gaining accurate information about a company is essential as this affects the making of decisions (Connelly et al. 2011) by investors, insurers, consumers and any other stakeholder group that is interested in the company. There are many ways of gaining information about the state of a company.

Traditional accounting covers the financial perspective which results in the issuing of an Annual report. In recent years it has, however, become obvious that the state of a company is not only a matter of the financial perspective of the firm but also of the so-called non-financial perspective. This includes the social and environmental impacts that the company is responsible for due to its operations. To inform about these activities and impacts, companies are now preparing, alongside the Annual report, a non-financial report (NFR). A combined financial and non-financial report provides a sustainability report.

It has become commonplace that investors and other stakeholders are increasingly using NFR information in the valuation of a company (Du et al. 2017) where relevant non-financial data is being called for (Du et al. 2017; Ekwurzel et al. 2017; Van der Lugt, van de Wijs & Petrovics 2020).

By the mid 1990's, companies in the Organization for Economic Co-operation and Development (OECD) countries were voluntarily providing a flow of information on non-financial issues (Brown, de Jong & Lessidrenska 2009). From 1999-2011 (12 years) corporations paid attention to environmental issues in the NFR (Hahn & Kühnen 2013) on more "traditional" topics such as the environment, corporate philanthropy and employees (Kolk 2004). Since 2016, the preparation of non-financial reports by enterprises has increased manifold globally (Van der Lugt, van de Wijs & Petrovics 2020). In summary, companies are faced with an increased demand to present an NFR and the question today is not whether to prepare a report but why, how and which report a company can produce to satisfy its stakeholders (Vukic et al. 2017).

### 1.1.1 Direct comparability

A key ingredient of NFRs, as required by stakeholders and legislature, is to be able to directly compare NFRs from one year to another and also to be able to compare reports between companies in the same branch and even in different branches (Langer 2006).

Comparability is referred to as that "the reported information shall be presented in a manner that enables stakeholders to analyze changes [environmental, social and economic] in the organization's performance over time, and that could support analysis relative to other organizations" (GRI 2016).

Direct comparability in this study means that information contained in the NFR's, can immediately be compared without having to convert the information first. Investors are

dependent on NFRs that are directly comparable in structure and content from a measurement perspective. Investors and other stakeholders are relying on NFRs that are directly comparable as they do not have the preconditions such as the time or even the knowledge to spend on rewriting and recounting the vast number of reports in order to make them comparable for analytical purposes.

Comparability increases when there is a move away from a diversity of practices (Tay & Parker 1990; Garrido, Leon and Zorio 2002) toward more uniform procedures (Garrido, Leon and Zorio 2002). Comparability decreases if the opposite occurs.

The compiling of NFRs is combined with a number of regulations that are intended to make the reports mandatory for large companies and comparable. From 2018 and onwards, NFRs must be prepared by companies within the EU with over 500 employees. This is regulated by the Council Directive 2014/95/EU (EU 2014/95/EU 2014). The Council Directive 2014/95/EU stipulates that the non-financial report is to contain information which is important for the development towards an economic, social and environmental “global economy by combining long-term profitability with social justice and environmental protection” (ibid.). A Council Directive 2017/C215/01 (EU 2017/C 215/01 2017) also came into force in association with the Council Directive 2014/95/EU, where guidelines in the preparation of the NFR were presented. The Council Directive 2017/C215/01 “Guidelines on non-financial reporting” is non-binding and provides a methodology including relevant content and recommended frameworks for companies when reporting their non-financial information.

Previous research shows however that published NFRs are diverse, providing incomplete and irrelevant information and in reality are difficult to compare (Hahn & Kühnen 2013; Boiral & Henri 2015; Diouf & Boiral 2017; Braam & Peeters 2018). This has led to a call for high quality information and harmonization of non-financial reporting (Dragomir 2011; Van der Lugt, van de Wijs & Petrovics 2020).

Non-financial issues and, more specifically, negative environmental impacts caused by a company’s activities are very important topics today, related to the state of our planet. The release of greenhouse gases (GHG) such as carbon dioxide (CO<sub>2</sub>) by enterprises is connected to the increase in global warming. Many researchers are of the opinion that an increase in global warming will lead to a change in the climate, a rise in sea levels, increased ocean acidification, life threatening weather events and severe societal impacts (Kweku et al. 2017). Investors and other stakeholders are very interested in the consequences of companies’ activities on the environment and use firms’ NFR as a means of obtaining information on for example UNSDG 13 “Climate Action” and emissions. “Climate Action” is about taking urgent action to combat climate change and its impacts.

## 1.2 Problem formulation

NFRs are of increasing importance where investors and other stakeholders want to know what companies are doing to address the non-financial (social and environmental) aspect of their enterprise in order for example to evaluate it.

To be of value to stakeholders, including investors, the NFRs need to be directly comparable. Such comparability is critical not only from an investor and stakeholder perspective, but also from a societal point of view since it is imperative for an efficient allocation of resources. However previous research has indicated a comparability problem. Despite the recent launching of EU Directives (the Council Directive 2014/95/EU, Council Directive 2017/C215/) addressing this issue and presenting recommendations there are still comparability problems, which leads to the main question in this study:

Has direct comparability of companies' NFRs, from a "Climate Action" and emissions perspective, increased within and between companies over the last decade as new regulations have been introduced?

## 1.3 Purpose

The purpose of this study is to compare over a ten year period, the NFR's of Large Cap companies on the Swedish Stock Market, from a "Climate Action" and emissions perspective, to determine if

- the direct comparability of NFRs has increased within companies
- the direct comparability of NFRs between companies has increased
- regulations launched during the past decade have increased the direct comparability of NFRs

## 1.4 Disposition of the study

The remainder of the report is organized as follows.

In chapter 2 the literature study is presented, with relevant theories that are used in the presentation and analysis of the study. In this part of the study the relevant regulations and frameworks associated with the drawing up of non-financial reports (NFR) are also identified and explained, including the relevant accounting regulations. Previous research in the relevant field is introduced together with a non-financial accounting framework known as Lamberton's model (Lamberton 2005). A Research model developed for this study is presented at the end of the chapter.

In chapter 3 the research method is presented including sampling, data collection and analysis methods. In chapter 4 results are presented and in chapter 5 they are analyzed in accordance with the analysis model and discussed. In chapter 6 conclusions are reached and in chapter 7 implications are presented. Finally, discussion of trustworthiness, limitations, generalization and suggestions for further study are presented in chapter 8.

## 2 Literature study

### 2.1 Relevant theories

A number of theories explain that management is subject to pressures which results with them having to inform stakeholders about their activities including, and in particular, non-financial activities in addition to financial activities. Two theories used to provide meaning to observations are signaling theory and institutionalizing theory. Signaling theory addresses asymmetry of information in an organization. There is a need for a firm to deal with this issue, where the company has information that stakeholders are interested in getting in order to make decisions. The institutionalizing theory addresses the affect that different pressures, such as laws, regulations and even other companies, have on a business and how the company reacts to these different pressures. Other theories such as Stakeholder theory where investors and other stakeholders are interested in the state of the firm could have been relevant for the study. However, the two theories chosen provide a theoretical frame of reference that contributes to achieving the purpose of the study.

#### 2.1.1 Signaling theory

Where two parties have access to different information, signalling theory can be used to describe the behaviour between these two groups (Connelly et al. 2011).

Three kinds of pressure lead firms to provide information on the company to stakeholders and these are:

- i. Pressure to reduce information asymmetry
- ii. Pressure to reveal companies' superior qualities
- iii. Pressure to acquire good will

The quality of the signal is also important for the stakeholder for it to be used in the decision-making process (Connelly et al. 2011).

These pressures are described in more detail as follows:

- i. Pressure to reduce information asymmetry

Fundamentally, signaling theory is based on an information asymmetry premise. In reality, company management has greater knowledge on firm activities than investors and stakeholder (Frankel & Li 2004; Connelly et al. 2011). Firms realise the importance of information in the decision making process and use different types of media to inform stakeholders about their activities. Traditionally information about a company was relayed in the Annual report where this information had a financial focus. Today this kind of information is insufficient when analyzing a company and is complemented with a non-financial report (NFR). NFR can thus be regarded as a means to reduce information asymmetry with regard to the social and environmental aspects of the company, where the party with more information presents it to others (Taj 2016; Moratis 2018).

ii. Pressure to reveal companies' superior qualities

In a competitive environment, companies compete for customers, investors, employees and other stakeholders (Janssen & Roy 2012). In order to remain competitive, companies are under pressure to signal to stakeholders about what they are doing and in particular about the companies' superior qualities. This includes not only financial status, but also non-financial qualities, which are gaining increasing attention among stakeholders (Vukic et al. 2017).

iii. Pressure to acquire goodwill

With ever increasing competition, many companies want to be considered as Goodwill firms with a reputation for social and environmental responsibility. Such responsibility is low according to some researchers (Moratis 2018) due to information asymmetry in the firm-stakeholder relationship. In order to gain recognition for the responsibility taken, companies are pressured to publish the information related to their social and environmental responsibility activities in an NFR (Rahman, Rodríguez-Serrano & Lambkin 2018).

The three kinds of signaling pressures have to varying degrees an effect on the quality of the signal provided by the company.

- 1) Effect of pressure to reduce information asymmetry
- 2) Effect of pressure to reveal companies' superior qualities
- 3) Effect of pressure to acquire good will

(1) While it is important for companies to respond to the pressure to inform stakeholders of their activities, it is equally important that the quality of the signal, in other words the information in the NFR, is high in order to maintain credibility with their stakeholders.

(2) The information in the NFR needs to be correct so that the reader can trust it. It is important that the reader does not have to wonder if the information revealed by the company describes a valid and reliable measure of the underlying quality that the firm is trying to communicate (Connelly et al. 2011; Moratis 2018). In other words, does the information provided in the NFR reflect what is really going on in the company? There are indications from researchers that a majority of stakeholders do not believe that firms honestly communicate their non-financial information (Moratis 2018). In other words, that the signal is false. Companies try to reveal qualities that are more superior than in reality.

(3) Outsiders should be able to observe the actions that insiders take, so that those actions taken by the company are useful as signals (Connelly et al. 2011). While the company is striving to acquire goodwill, it is important for the reader of the NFR, that any changes in a company activities and their corresponding social and environmental impact can be seen by the stakeholder when reading the NFR.

### 2.1.2 Institutionalizing theory

Companies are subject to influences from social, political and economic systems that put pressure on, and have expectations of, the company (Bell, Bryman & Harley 2019). This is

addressed in Institutionalizing theory which is about the impact that these systems have on the company (Bebbington & Unerman 2018) and results in so called institutional isomorphism (DiMaggio & Powell 2000; Perez-Batres, Miller & Pisani 2011).

Institutional isomorphism describes where companies are pressured to resemble each other in structure and features (Maama 2020). Different institutionalizing pressures or mechanisms that are identified in literature (DiMaggio & Powell 2000) are:

- i. Coercive pressure
- ii. Mimetic pressure
- iii. Normative pressure

These pressures are described in more detail as follows:

- i. Coercive pressure

Enterprises can gain legitimacy as a result of coercive pressure. Legitimacy is about meeting and adhering to the expectations of a social system's norms, values, rules and meanings (Martínez-Ferrero & Sánchez 2016). This is where the firm complies with rules and norms imposed by external forces in the form of laws for example (ibid.). Companies are required to comply with rules that can originate from external regulators, including the EU Council Directives 2014/95/EU, Council Directive 2017/2017/C215 and the Annual Accounts Act. These compel companies to prepare an NFR and also to prepare NFRs in a specific way. Furthermore large corporations also have an impact on their subsidiaries by imposing their practices (DiMaggio & Powell 2000) which can be considered a form of coercive pressure.

- ii. Mimetic pressure

Companies look at successful peers, in the same industry in particular, in search for legitimacy where they copy model companies and adopt a widely accepted behaviour. In this way they gain legitimacy or acceptance in society by adhering to a social system's norms (Martínez-Ferrero & Sánchez 2016) which eventually can lead to uniformity of procedures of structures and activities. Organisations copy other major companies in the same organisational field, defined as "sets of organizations that, in the aggregate, constitute a recognized area of institutional life; key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products" (DiMaggio & Powell 2000).

- iii. Normative pressure

Legitimacy can be derived from what is considered to be the professionally correct thing to do or moral compliance (Martínez-Ferrero & Sánchez 2016). Examples of this are the influence of formal education and professional networks. Conferences etc. are used to present legitimacy offering guidelines for compiling NFRs. A more recent actor offering legitimacy is non-governmental organisations (NGOs) (Deegan & Unerman 2011; Perez-Batres, Miller & Pisani 2011; Boiral & Henri 2015; Fagerström, Hartwig & Lindberg 2016a; Fagerström & Hartwig 2016). NGOs such as the GHG Protocol play a role in influencing the Large companies in this study with regard to the issue of climate change.

The three kinds of institutionalizing pressures have to varying degrees an effect on the uptake of voluntary non-financial issues by corporations where again mimetic and normative pressure play a more important role than coercive pressure (Perez-Batres, Miller & Pisani 2011; Cubilla-Montilla et al. 2020).

- 1) Effects of coercive pressure
- 2) Effects of mimetic pressure
- 3) Effects of normative pressure

(1) Coercive pressure from some organisations such as consumer services have a positive effect on a company's GHG disclosure decisions (Chithambo et al. 2020). The Annual Accounts Act for example is a coercive institutionalization mechanism from an NFR perspective.

(2) Mimetic pressure can be seen in the case of the United Nations Global Compact (UNGC) framework where when a company is listed on the New York Stock Exchange (NYSE) the firm has a tendency to sign the UNGC. Mimetic pressures can be seen at a national and branch level where organisations turn to other organisation for guidance influence the spreading of information (Cubilla-Montilla et al. 2020). Companies that belong to the same country show similar non-financial reporting practices as they share the same values and set of cultural pressures (Galli & Bassanini 2020). Mimetic pressure from some organisations such as consumer services have a positive effect on a company's Greenhouse gas (GHG) disclosure decisions (Chithambo et al. 2020).

(3) From a normative pressure perspective, the academic environment is where influence can originate and evolve. University-based behaviour such as universities getting involved in local and national communities can promote learning partnerships for a sustainable community (Bebbington & Unerman 2018). This is something similar to the UNGC which promotes the establishment of learning partnerships for a sustainable world (ibid.). Academia's role in the development of the United Nations Sustainable Development Goals (UNSDG) can be seen as a normative influence where three perspectives are observed. Academia can evaluate and promote how accounting can be used in the context of target setting, accounting technologies and reporting of the UNSDG.

SDG are already being researched in different fields within sustainable development accounting, social and environmental disciplines. New areas of investigation and theorization are being highlighted due to the connection of SDGs with other disciplines than accounting such as social sciences, humanities and natural sciences. SDGs can be seen to provide an opportunity for the sustainable development accounting field to develop its contributions to this field (Bebbington & Unerman 2018). Normative pressures while not mandatory such as the accountancy profession can and do have an influence on how the NFR is composed. The GHG Protocol contributes in a normative way to the work on GHG emissions carried out by enterprises.

The institutionalized environment is supposed to contribute to the development, standardization, uniformity of practices and thus comparability of NFRs. Coercive pressures are exerted by the Council Directive 2014/95/EU and the Annual Accounts Act. With regard to mimetic influences these Large Cap companies are leaders in their field and look to other large companies for guidance. The Council Directive 2017/C215/01 and the GHG Protocol provide normative guidance in the development and uniformity of procedures and thus comparability of NFRs.

## 2.3 Directives and frameworks represent different institutional pressures

Stakeholders are interested in obtaining non-financial information from companies in order to determine the social and environmental impacts of the company's activities. While signaling pressures are important to ensure that companies' prepare an NFR, laws and regulations have been implemented in an attempt to provide non-financial reports that are comparable. There are examples of binding or non-binding institutionalizing pressures acting on companies in the form of Directives, frameworks and accounting regulations. These play a part in shaping the report from a standardization, comparability and uniformity of procedures perspective. This section explains the directives, frameworks and regulations that are relevant for this paper.

### 2.3.1 Two main EU Directives that address NFR presentation

The Council Directive 2014/95/EU is a coercive pressure and the Council Directive 2017/C215/01 is a non-binding influence on the NFR.

#### i. Council Directive 2014/95/EU (EU 2014/95/EU 2014)

The Council Directive 2014/95/EU with regard to disclosure of non-financial and diversity information by certain large companies and organizations came into force in the EU in 2014. It is a coercive pressure on the development of the NFR which in practice came into effect in 2018. The first NFR's under this legislation were released by the relevant companies in early 2019. The European Parliament recognized the importance of business informing on environmental factors "with a view to identifying sustainability (non-financial) risks and increasing investor and consumer trust". The relevant organizations should give a fair and comprehensive view of their policies, outcomes and risks. An example of this can be seen with regard to greenhouse gases (GHG) where the firm releases the environmental details of the current and foreseeable impacts of the firm due to GHG emissions.

#### ii. Council Directive 2017/C215/0 (EU 2017/C 215/01 2017)

Within the Council Directive 2014/95/EU provision is made for the preparation of non-binding guidelines on methodology for the non-financial report (NFR). In June 2017 the EU published these guidelines in the Council Directive 2017/C215/01. The purpose of the guidelines is to help companies provide high quality, relevant, useful, consistent and more comparable non-financial (environment, social and governance related) information in a way that encourages resilient and sustainable growth and employment and provides transparency to stakeholders (See Appendix A for more information).



### 2.3.2 Critical features in preparing NFR's

There are two features, i. content and ii. framework, that are considered important in the preparing of an NFR and are highlighted in the above Directives.

#### i. Content

The content of the NFR should include information on the following: business model, policies and due diligence, outcomes, principal risks and their management, key performance indicators and thematic aspects. According to the EU Directive 2017/C 215/01 2017 companies “shall” include in a non-financial report “information to the extent necessary for an understanding of the undertaking’s development, performance, position and impact of its activity, relating to, as a minimum, environmental, social and employee matters, respect for human rights, anti-corruption and bribery matters” (EU 2017/C 215/01 2017) and also supply chain and conflict minerals.

#### ii. Framework

According to the Cambridge Dictionary a framework is a “supporting structure around which something can be built” (Cambridge Dictionary n.d.). The purpose of a framework is to provide a company with a structured template for reporting key issues of interest which makes information easier to compare. In this report a framework is used by companies to give structure to their work on climate change. There are approximately 21 frameworks recommended in the Council Directive 2017/C215/01, where due to how the Directive is worded it is left up to the interpretation of the readers as to how many frameworks they can choose from in preparing their NFR. By this is meant that initially under the framework section (Section 5) of the guidelines the following frameworks are mentioned with the following wording: Union-based frameworks include the Eco-Management and Audit Scheme (EMAS), or international frameworks such as the United Nations (UN) Global Compact, the Guiding Principles on Business and Human Rights implementing the UN ‘Protect, Respect and Remedy’ Framework, the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises, the International Organisation for Standardization's ISO 26000, the International Labour Organization's Tripartite Declaration of principles concerning multinational enterprises and social policy, the Global Reporting Initiative, or other recognised international frameworks”.

The Council Directive 2017/C215/01 further states that “Companies may also consider using other reporting frameworks, such as those mentioned in the introduction to these guidelines”. A number of the frameworks mentioned in the introduction to the guidelines are specific for climate change, some of which are the Carbon Disclosure Project (CDP), the Climate Disclosure Standards Board, the Natural Capital Protocol and the United Nations Sustainable Development Goals (UN 2020a) to mention a few. The UNSDG is one of the frameworks highlighted in this report. According to the Council Directive 2017/C215/01 the company must declare which framework is used in the preparation of the report.

### 2.3.3 General & specific frameworks used for climate change measurement in NFRs

The frameworks used by managers play a major role in the preparation of the NFR, which makes it important to identify and analyze the frameworks commonly used by companies. There are approximately 21 different frameworks recommended in the EU Guideline Directive 2017/C 215/01 2017. The choice of which framework a company chooses in preparing an NFR is voluntary and more than one framework can be chosen by each firm. Some frameworks, mentioned in the EU Guideline Directive, that are commonly used by companies are presented here (see also the Method section, Results section and Appendices B, C, D and E for more information). The GHG Protocol is also mentioned here due to its extensive use by companies. Furthermore while three of these frameworks, GRI, UNSDG and GHG Protocol address measurement of CO<sub>2</sub>e emissions, the GHG Protocol due to its specific focus on just Climate affecting emissions is written about in more detail than the other two frameworks.

Some of the frameworks commonly used by companies' when preparing an NFR are:

- i. Global reporting initiative (GRI)
- ii. United Nations Global Compact (UNGC)
- iii. United Nations Sustainable Development Goals (UNSDG)
- iv. Carbon Disclosure Project (CDP)
- v. GHG Protocol

#### i. Global reporting initiative (GRI)

The GRI organization was founded in 1997 where there was a need to merge different reporting systems into one (Dragomir 2011). GRI is an independent international organization that provides help to governments and businesses all over the world to communicate on issues such as human rights, social well-being and climate change. GRI has concentrated on financial and non-financial reporting allowing for action to be taken on social, environmental and economic challenges where public interest is in the forefront (GRI 2020a). A company can choose to comply with legal requirements by establishing a GRI report. The company must then ensure that all disclosure requirements included in the Annual Accounts Act have been complied with in the GRI report. That is to say that a report prepared in accordance with GRI is not sufficient to automatically satisfy the legal requirement (ibid.) (see Appendix B for more information).

Three principles are the basis of the GRI reporting framework: transparency, inclusiveness and audibility, where the latter focuses on data quality. These three basic principles have eight complementary principles divided into three categories: what information to report, quality and reliability and the accessibility of reporting information (Moneva, Archel & Correa 2006).

#### ii. United Nations global compact (UNGC)

The UNGC is a call to companies to align their strategies and operations with ten universal principles. It was developed in 2000 and the 10 principles are in four main areas which are

Human rights, Labour, Environment and Anti-corruption (UNGC 2020) (See Appendix C for information).

In practice the UNGC is a statement of commitment from a corporation to the UN Secretary-General declaring that they are aligning the company's strategies and operations with the ten universal principles. To join the UNGC the highest level executive in a company commits publicly to the Secretary-General of the UN that the company will take a responsible, principle-based and integrated approach to implement the Ten UNGC Principles, take action in support of UNSD goals and submit an annual Communication in progress (UNGC 2020).

The Global Compact is intentionally vague and flexible and can sometimes create resources and guides that business and non-profit organizations can use in their efforts to achieve their sustainability development goals (ibid.).

### iii. United Nations Sustainable Development Goals (UNSDG)

The United Nations Sustainable Development Goals are identified in the Council Directive 2017/C215/01 as one of the frameworks that can be used by organizations when drawing up their non-financial report.

The UNSDGs were developed by the United Nations in order to address the global challenges today and in the future where it is important that the goals are achieved by 2030. The UNSDG were adopted by United Nations Member States in 2015. There are 17 goals listing 232 indicators (UN 2020a). The goals are used to chart a "universal, holistic set of objectives to help set the world on a path towards sustainable development" using all three dimensions of sustainable development, environmental, social and economic (Thomas, Tennant & Rolls 2000). UNSDG number 13 "Climate Action" - take urgent action to combat climate change and its impacts and emissions, is focused on in this study (see Appendix D for more information).

### iv. Carbon Disclosure Project (CDP)

The CDP is an NGO "that run the global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts" (CDP 2020). The CDP administers the carbon disclosure rating which is based on the individual company voluntarily disclosing their climate change information to CDP using a questionnaire (CDP 2020a). This questionnaire is submitted to CDP and a rating is then calculated by the NGO. The ratings are A, A-, B, B-, C, C-, D, D- and F where A is the highest rating and F the lowest. An F score can be either due to a poor score or that the company did not respond to CDP's request for information. When a company obtains an A score this reflects that the company's management has relevant knowledge on climate change issues and are incorporating these issue into their strategic business plans. In the questionnaire the climate change units of measurement and physical quantities are measured in CO<sub>2</sub>e and metric tons where Scope 1 and Scope 2 are included (See Appendix E).

#### v. GHG Protocol

The GHG Protocol is not one of the aforementioned frameworks referred to in the EU Guideline Directive. However, as it is an important framework that is commonly used by many companies it is included in this report. It is a normative influence on how NFR's are formed and provides companies with guidelines on how they can measure the different greenhouse gas emissions. There was a call as far back as 1998 from some companies in cooperation with the World Resources Institute (WRI) and The World Business Council for Sustainable Development (WBCSD) to address environmental matters, specifically issues and the measuring and reporting of same (Cook, Petroleum, Motors, Monsanto & WRI 1998). This resulted in the development of the GHG Protocol in 1998.

Cities, countries and organizations use the standards developed within the GHG protocol where tools and online training help them to track progress towards their climate change goals. Some of GHG climate change goals are set up by the Paris Agreement. The Paris Agreement (UN 2015) was adopted in 2015 within the United Nations Framework Convention on Climate Change (UNFCCC). It came into force in 2016. The Agreement's central aim is to contribute to the global response on climate change by keeping a global temperature rise this century well below 2 degrees Celsius compared to pre-industrial levels and to attempt to limit the temperature increase to 1,5 degree Celsius (UNFCCC 2020). In July 2020, 189 of 197 Parties have ratified the Paris Agreement.

The GHG Protocol has been set up to give guidance to organizations and companies on how to manage their GHG emissions. What causes climate change is the release of so called greenhouse gases (GHG) into the atmosphere. There are seven GHG – carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PCFs), sulphur hexafluoride (SF<sub>6</sub>) and nitrogen trifluoride (NF<sub>3</sub>). There are different types of GHG emissions which are described below.

#### 2.3.4 Different types of GHG emissions

Within the GHG protocol there are three levels of emissions.

- i. Scope 1 is all direct emissions from activities of an organization or under the control of the organization.
- ii. Scope 2 is the indirect emissions from electricity purchased and used by the organization.
- iii. Scope 3 is all the indirect emissions from activities of the organization originating from sources that they do not own or control. Scope 3 emissions can come from material suppliers, third party logistics (3PL) providers, waste management suppliers, travel suppliers, lessees and lessors, franchisees, retailers, employees and customers. Scope 3 of the GHG protocol was released in 2011 (GHG Protocol 2011; UNFCCC 2020).

### 2.3.5 Measuring GHG emissions

i. Scope 1 emission is calculated on the purchased quantity of fuels (natural gas for example) using published emissions factors. Scope 2 GHG emissions are calculated from electricity used and published emissions factors. Scope 3 GHG emissions are calculated from fuel use, km travelled and published or third party emission factors (GHG Protocol 2004).

ii. CO<sub>2</sub> is the most common Greenhouse gas (GHG). CO<sub>2</sub>e is the unit of measurement used in the GHG Protocol where different GHG are converted to this common unit of measurement. CO<sub>2</sub>e or CO<sub>2</sub> equivalent is the amount of CO<sub>2</sub> that would have the same global warming potential (GWP) that CO<sub>2</sub> would have where CO<sub>2</sub> GWP is 1 (GHG Protocol 2016).

### 2.3.6 Indicators and units of measurement used by companies in NFR reporting

Three indicators that can be used by companies when measuring for climate change are greenhouse gases (GHG), carbon dioxide (CO<sub>2</sub>) and Carbon (C). CO<sub>2</sub> equivalent (CO<sub>2</sub>e) and CO<sub>2</sub> are two units of measurement that can be used when measuring for climate change. With regard to units of measurement, CO<sub>2</sub>e is the unit of measurement used in the GHG Protocol where different GHG are converted to this common unit of measurement. Please see 2.4.3 (5) above for more information on GHG and CO<sub>2</sub>e. The indicator CO<sub>2</sub> can have CO<sub>2</sub> as its unit of measurement and can also have the unit of measurement CO<sub>2</sub>e. The latter is the amount of CO<sub>2</sub> that would have the same global warming potential (GWP) that CO<sub>2</sub> would have where CO<sub>2</sub> GWP is 1 (GHG Protocol 2016; Rapley 2017). With regard to the indicator C, the unit of measurement is carbon dioxide or CO<sub>2</sub>e (WCRP 2020). The Global Climate Observing System (GCOS) in 2017 referred to these climate change indicators where CO<sub>2</sub> is used in measuring historic data, GHG is used to measure future data and C is used to measure existing data (includes CO<sub>2</sub> and CH<sub>4</sub>) (Rapley 2017).

## 2.4 Accounting regulations connected to the preparation of NFRs

### 2.4.1 The Annual Accounts Act (1995: 1554)

The provisions for non-financial reporting in the Annual Accounts Act are to be found in Chapter 6 § 10 (ibid.). The law states that companies that fulfill more than one of the conditions laid out in the law are defined as large companies and must provide an NFR. This law is a coercive pressure on companies (See Appendix F for more information). This Act can be compared to the EU Directive 2017 which is non-binding and therefore there is no pressure on the companies to follow these guidelines.

## 2.5 Observations in previous research on NFR preparation

Previous research on non-financial reporting is presented and explained below. As mentioned in 1.4 above, in order to carry out this study the UNSD goal number 13, “Climate Action” and emissions, was addressed. “Climate Action” is about the need to “take urgent action to combat climate change and its impacts” (UN 2020a).

Previous research that is primarily focused on non-Swedish companies, indicates that there is a problem with the comparability of NFRs between companies and over time (Hahn & Kühnen 2013; Boiral & Henri 2015; Diouf & Boiral 2017; Braam & Peeters 2018).

There is a close connection between comparability and uniformity of procedures. As mentioned in 1.1 above, comparability increases when there is a move away from a diversity of practices (Tay & Parker 1990; Garrido, Leon and Zorio 2002) toward more uniform procedures (Garrido, Leon and Zorio 2002). Comparability decreases if the opposite occurs.

### 2.5.1 Frameworks and NFR preparation

#### i. The use of different frameworks

Previous research has shown that there is no universally accepted accountability tool/framework for companies to use when reporting on their non-financial impacts (Ranganathan 2017).

Researchers have also found that too many frameworks compete with each other and undermine the comparability of the NFR (La Torre et al. 2018).

#### ii. The use of GRI as a framework

The GRI framework has in previous research been associated with problems connected to NFR preparation over the years (Dragomir 2011; Hahn & Kühnen 2013; Goicoechea, Gómez-Bezares & Ugarte 2019). Boiral & Henri (2015) found that despite the fact that all companies used the same GRI framework when drawing up the NFR, it was impossible to compare the reports as the provided information cannot be trusted. This results in a credibility gap and mistrust toward the non-financial information provided by the organization (Boiral & Henri 2015).

The flexibility provided by, for example, GRI guidelines in comparison of different sectors, leads to a greater variety of reports, resulting in difficulties in comparing them (Zsóka & Vajkai 2018). Different sized companies and different branches contribute to a diversification of NFRs (Langer 2006).

#### iii. Unreliable and non transparent information

Researchers have found that GRI framework-based report are not as sustainable as they declare on such issues as gas emissions (Moneva, Archel & Correa 2006). Previous research has shown that a false signal can be given by a firm of the unobservable activities within the firm (Connelly et al. 2011).

### 2.5.2 Indicators and NFR preparation

#### i. Lack of continuity

Previous research has shown that indicators can vary from year to year (Fagerström, Hartwig & Lindberg 2016a; Fagerström & Hartwig 2016). In some companies a totally new indicator for an existing problem is developed from one year to another resulting in it not being possible to compare the reports for that issue (Zsóka & Vajkai 2018).

#### ii. Lack of standardization

Some researchers found that the use of certain indicators limited the standardization and comparability of NFRs as the indicators are too general, too vague and tend to be selected, adapted or modified according to the needs of the company. Under these circumstances comparing information on actual performance is not possible (Diouf & Boiral 2017).

One of the practical problems connected to indicator use is the poor availability of standardized, open and comparable data (Klopp & Petretta 2017). There is a practise among major organisations connected to the development of indicators that they each recommend only one indicator when measuring for climate change. For example the United Nations Environment Program UNEP proposes GHG as an indicator (Thomas, Tennant & Rolls 2000). The World Climate Research Program (WCRP) presents Carbon as an indicator of Climate Change (WCRP 2020).

### 2.5.3 Units of measurement and NFR preparation

#### i. Two units of measurement

In order to measure for climate change two units of measurement are recommended by researchers (Schaltegger & Burritt 2010), CO<sub>2</sub> and CO<sub>2</sub>-equivalents (CO<sub>2</sub>e).

#### ii. One unit of measurement

Some researchers (Boiral & Henri 2015; Diouf & Boiral 2017; Ranganathan 2017; Staupoulou & Sardianou 2019; Thomas, Tennant & Rolls 2020) have shown that the use of different units of measurement over time in the same company results in the lack of direct comparability of NFRs.

These researchers have found that when units of measurement are not the same in NFRs this leads to difficulties in measuring non-financial performance (Diouf & Boiral 2017). Researchers that studied NFRs of 12 mining firms found that one reason for the incomparability of the reports was due to data heterogeneity connected to units of measurement (Boiral & Henri 2015). Consequently it is considered essential that data is expressed in the same units of measurement in order to use that data to compare for example emissions between and within companies and over time (Thomas, Tennant & Rolls 2000; Klopp & Petretta 2017).

As different sectors measure issues in a different manner, data in NFRs must be expressed in the same measurement units for comparability purposes (Staupoulou & Sardianou 2019)

### 2.5.4 Physical quantities and NFR preparation

#### i. A mix of physical quantities

When physical quantities are not the same in the preparation of NFR's this leads to difficulties in measuring non-financial performance (Diouf & Boiral 2017; Boiral & Henri 2015).

Some researchers consider it important to have the same physical quantity in order to make it easier to compare performance (Dragomir 2011; Staupoulou & Sardianou 2019)

## ii. Physical quantities mixed up

In order to be able to compare non-financial reports a number of steps must be taken. Firstly, relevant indicators are chosen with a relevant measurement unit. Units of measurement are assigned a number which is expressed in a physical quantity such as ton (Dragomir 2011) (see Table 1).

The poor comparability of different companies NFRs is connected to the lack of companies using the same physical quantities (Thomas, Tennant & Rolls 2000).

## 2.6 Research model

The basic presumption behind the Research model (see Figure 1) is that Signaling and Institutionalizing pressures affect the direct comparability of the NFRs due to the influence on the uniformity of procedures. A component of the research model is the Analysis model used in the study.

Questions asked on each level are:

- 1) What about direct comparability of single companies' NFRs over time?
- 2) What about direct comparability between companies' NFRs?
- 3) Have regulations launched over the past decade influenced the direct comparability of NFRs?

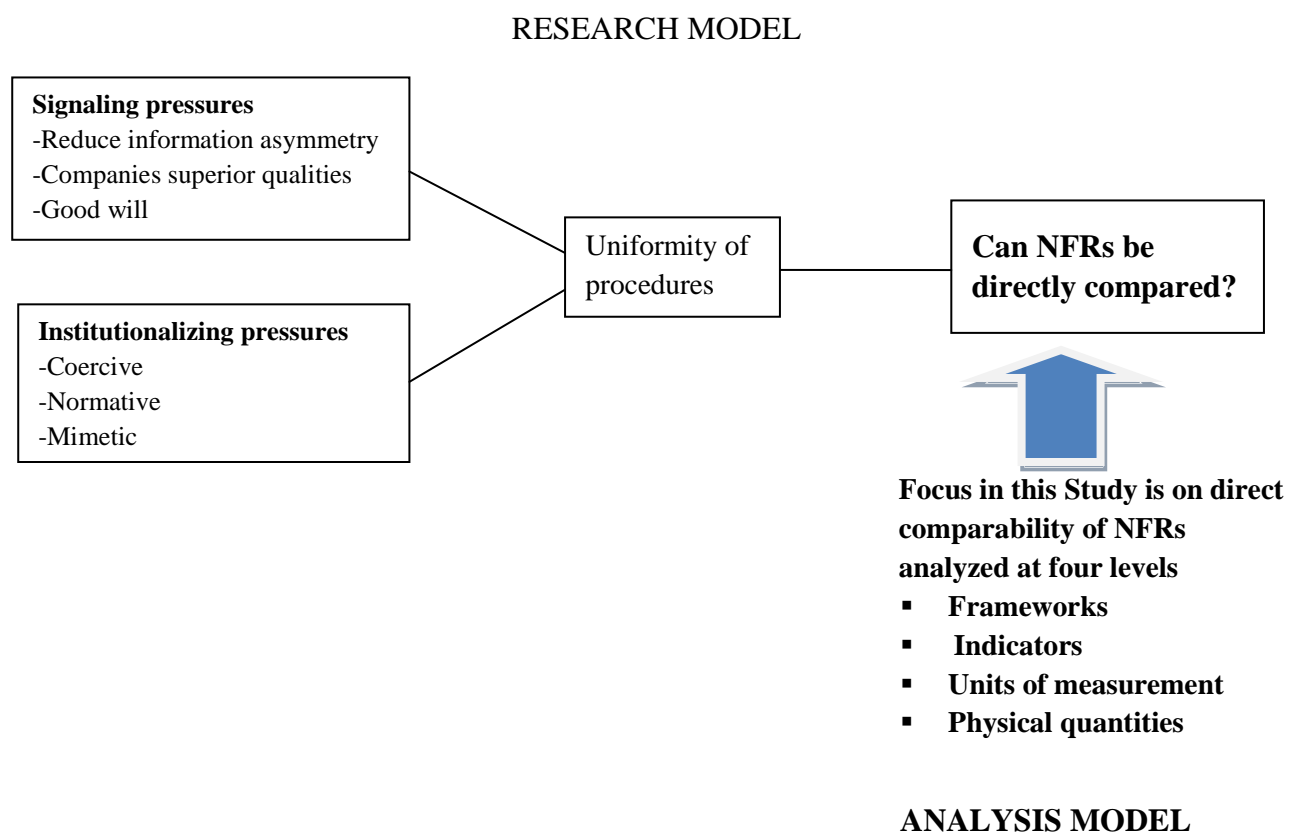


Figure 1. Research model and the Analysis model for the study.



### 3 Method & method discussion

#### 3.1 Research approach

A literature review is carried out where no hypotheses are derived but where questions are asked. This points to a semi-inductive approach where a theoretical position was developed prior to the collection of data (Saunders, Lewis & Thornhill 2009; Creswell 2012; Bell, Bryman & Harley 2019).

The semi-inductive method was chosen as an alternative to a purely inductive method and a purely deductive method. The study however is also quantitative as opposed to qualitative where the analysis is mixed in nature as it is not based on statistics but on comparative reasoning. In order to achieve the purpose of the study, focus was on companies' NFRs where the researcher was independent of what is being researched (Saunders, Lewis & Thornhill 2009). The collection of quantitative data (ibid.; Creswell 2012) in this study involved information from 24 different company NFRs. Furthermore, quantitative data was collected in order to measure change over time (Creswell 2012) and this fits in with the purpose of the study where firms NFRs were looked at over a ten year period. The researcher in a quantitative research identifies relevant components and seeks to measure them (ibid.) An Analysis model with specific components relevant for the study was developed from Lamberton's model and subsequently tested in the study. Lamberton used financial accounting information to present a non-financial accounting framework (See Appendix H). Please refer to paragraphs 2.5.1 to 2.5.4 for information on the Analysis models' components which are frameworks, indicators, units of measurement and physical quantities. Please refer to figure 1 to observe the connection between the Research model and the Analysis model.

#### 3.2 The population and a sample of the population

The population consisted of Large Cap companies on the Stockholm Stock Market (OMX). The reason for choosing these companies (more than 500 employees) is that they are required by the Council Directive 2014/95/EU to prepare a non-financial report (see section 2.3 above) (Council Directive 2014/95/EU). Small and Medium-sized enterprises (SMEs) are exempt from this Directive due to among other things the size of these companies (fewer than 250 persons). Due to time limits the entire population was not used in this study, so a sample of the population was chosen.

Originally 129 companies on the Stockholm Stock Market were identified for this study after a data search was carried out in 2020 (Di 2020). Duplicates were excluded which refers to the fact that some companies have subsidiaries but have only one non-financial report. After excluding duplicates the sample frame consisted of 97 different companies from which a sample of 24 companies was chosen. The following procedure was undertaken to select the sample of 24 from these 97 companies. Each of the 97 companies was given a unique number from 1 to 4 where the first company was numbered one, the second 2 and so on (see Appendix G). Then all the companies that had the number 4 were selected for the study. This resulted in

24 companies being selected for this study, which is a sampling fraction of  $\frac{1}{4}$  of the original sampling frame.

The most updated information available was used, which were the non-financial reports (NFR) of the twenty four selected companies over a ten year period from 2010 to 2019 (released in early 2020).

### 3.3 The selection procedure

Describing the selection procedure when choosing the articles in the literature study and the selection of companies, first from the sampling frame and then the selection of 24 companies, contributed to the transparency of this study. Furthermore the selection of the NFRs from the companies' homepages also provided transparency in the selection process.

#### i. Using a sample of the population instead of the entire population

When the selection of companies was reduced from 97 to 24 companies there is a question as to whether the selected companies are representative of the sampling frame. Would the results be different if the selected companies were from different branches or primarily from a certain branch or is this relevant? This validity problem is widespread where a sample is used and one should be aware of it. However in this study the companies are large and successful in their branch so they have a similar approach to how they manage their NFRs. There is a degree of mimicry between these companies, which may make little difference to the result if other large companies were chosen.

A systematic sampling method was used in this study with the aim to be sufficiently unbiased allowing conclusions to be drawn for the population as a whole (Creswell 2012). Systematic sampling does not require face to face contact when collecting data which was relevant for this study (Saunders, Lewis & Thornhill 2009). The 24 large selected companies are found in 15 different branches. Please see Table 1 in order to see the branches in which the companies are operating. The different branches are business services, food production (2), retail (2), data, IT & telecommunication, wholesale (3), construction, design & interior design (3), motor vehicle trade, electronics, metal (3 firms), mining, paper and stationary, manufacturing (2 firms), machines, pharmaceutical and household appliances (see Table 1). See Appendix I for more information on these companies.

Table 1. The different branches that the 24 selected companies are operating in.

Sector	
Business services	1
Manufacturing and Industry	10
-electronics	
-metal(3)	
-mining	
-paper & stationary	
-manufacturing(2)	
-machines	
-pharmaceutical and household appliances	

Food Production	2
Retail	2
Data, IT & Telecommunication	1
Wholesale	3
Construction, Design & Interior Design	3
Banking, Finance & Insurance	1
Motor Vehicle Trade	1

#### ii. Choosing only large companies

A relevant question here is what would the results have been if SME companies were chosen in the study? SMEs do not have the same financial resources as large companies, so while small companies would like to copy the behaviour of large companies there is a question of them being financially able to do so. This could result in very different results depending on which companies were selected. SMEs are not included in the Council Directive 2014/95/EU so this issue will not arise in this study but may be relevant in other studies.

The data was collected in a systematic manner where specific kinds of data was collected from the NFRs over a certain timeframe, which was described in detail so that the reader and researchers could follow the steps and repeat them.

#### iii. A ten year time span

The ten years chosen for this study is the most recent decade from 2010 to 2019. Important events have occurred from a “Climate Action” and emissions perspective during this time which highlights the urgency of this issue. These events include the introduction of Scope 3 of the GHG Protocol in 2011, the UNSDG in 2015 and the Paris Agreement in 2016, as well as the enforcement of the EU Directives in 2017 and 2018. The reason for looking at these regulations is to determine if their introduction is reflected in the results of this study. If the study had focused on the ten previous years, from 2000 to 2009, the results of the study would most likely have been different.

Regarding measuring for different Scopes of GHG emissions (see 2.3.2 (5) above) during the decade, the year 2019 was selected for analysis. The reason for choosing the year 2019 and Scope 3 emissions was that GHG Scope 3 emissions are the most recent of the GHG Scopes. It was introduced in 2011, therefore the year 2019 was studied in order to identify whether all companies had adopted it by that year or not.

It may be noted, however, that the results of this study were manually prepared. By using various programs other researchers may acquire different perspectives and results something that is not gone into further detail here other than to highlight it.

### 3.4 Data collection procedure

This study was a longitudinal study, which refers to where the companies are looked at over a period of time, in this study ten years. The companies chosen operated in different branches. The NFRs of 24 selected companies were studied over ten years (from 2010 to 2019) in order to see if

- The direct comparability of NFRs has increased within companies.
- The direct comparability of NFRs between companies had increased.
- Regulations launched during the past decade had increased the direct comparability of NFRs.

The non-financial data was collected on the internet from the non-financial reports of the 24 selected companies. NFRs were searched for on each of the organizations' homepages where the report was a standalone report or a statement or part of the Annual report. From the 24 selected companies, their NFRs for 2010 up to and including 2019 was downloaded onto an excel file on the author's computer, in total 240 different NFRs.

The data was collected in a systematic manner (Eisenhardt 1989; Saunders, Lewis & Thornhill 2009) where specific kinds of data was gathered from the NFRs over a certain timeframe. One main time frame, a decade, was chosen in this study. With regard to the climate change issue a search was made in each of the NFRs for the relevant frameworks, indicators, units of measurement and physical quantities over a ten year period.

The words climate, climate change, emissions, greenhouse gases, GHG, carbon, carbon dioxide, CO<sub>2</sub> and CO<sub>2</sub>e were typed into all of the 240 non-financial reports in order to identify the indicators, units of measurement and physical quantities for climate change in these reports. The presence or absence of indicators and units of measurement in the non-financial report was noted and the information written into the excel file.

There were 21 frameworks mentioned in the Council Directive 2014/95/EU which companies were recommended to use when preparing their NFRs (see section 2.3.1 (ii b) above). As this study is focused on the environmental dimension of the non-financial report, many of these frameworks were not suitable when measuring for environmental issues such as OECD Human and business issues and other OECD guidelines on human rights, the LO Tripartite Declaration, other guidelines for financial reporting and the International integrated reporting framework. All remaining frameworks were initially searched for but it became clear early on in the search that there were only four frameworks that companies used. These were Global Reporting Initiative (GRI), United Nations Global Compact (UNGC), United Nations Sustainable Development Goals (UNSDG) and Carbon Development Project (CDP). All these frameworks were searched for in the selected companies' NFRs over the ten years. This was done by typing in all four frameworks mentioned into the computer to identify which frameworks were being used by the companies in this timeframe. Their presence or absence in the NFRs of 24 companies was noted and the information was written into an excel file.

### 3.5 The analysis procedure

For the purpose of this study, comparing companies NFRs with regard to climate change issues means that "The reader can *directly* compare emissions without having to change either the units of measurement or physical quantities (see also section 1.1). The emphasis on the word *directly* was to highlight that the focus in the report was to study the direct

comparability of the NFRs. Direct comparability means that it was not necessary to convert the units of measurement and/or physical quantities before a comparison of the NFRs could be made.

For the purpose of comparing the data over time and between companies an Analysis model with inspiration from Lamberton's model (Lamberton 2005) was developed in this study (See Appendix H). The Analysis model components (see Figure 1 and Table 2) are frameworks, indicators, units of measurement and physical quantities. In order to carry out the purpose of the study the Analysis model's components were used. These components were searched for in all of the twenty four selected companies' NFRs to find out what model components companies are using and how they are using them in measuring for the environmental dimension of non-financial reporting, UNSDG 13 "Climate Action" and emissions, over time.

The following Analysis model components were analyzed.

- 1) Frameworks
- 2) Indicators
- 3) Units of measurement
- 4) Physical quantities

Please refer to Table 2 to gain a view of the data to be analyzed for this study.

Table 2. An overview of the Analysis model components analyzed in this study

<b>Analysis model components</b>	<b>Data for analysis</b>
Frameworks	GRI, UNGC, UNSDG and CDP
Indicators	GHG, CO2 and C
Units of measurement	CO2e and CO2
Physical quantities	Tons, tonnes, Mtons, kt etc.

Comparability of NFRs was looked for and analyzed at the different levels of the Analysis model. The different levels are the frameworks, indicators, units of measurement and physical quantities used by companies' in the preparation of the NFRs (see Table 2).

The collected data was analyzed as follows to see if there was any change in the use of the Analysis Model components where:

The data was compared over time and the questions to be answered were are companies using every year the

- 1) Same frameworks?
- 2) Same indicators?
- 3) Same units of measurement?
- 4) Same physical quantities?

The data was compared between companies and the questions to be answered were are companies using the

- 1) Same frameworks?
- 2) Same indicators?
- 3) Same units of measurement?
- 4) Same physical quantities?

i. Comparison with previous research

The results were compared with previous studies. The motivation for this was to strengthen the results of this study by comparing them with other researchers work.

ii. The influence of regulations on direct comparability of NFR's

Different regulations introduced during the decade were identified and analysed. This was carried out to determine the regulations influence on direct comparability of NFR's.

### 3.5 Data loss

In this study there was no data loss because the report was continuously saved onto to the author's computer and a copy was also sent in the author's email. The computer has been kept in a safe place and not been affected by liquids, hard drive crashes, software corruption, hackers or viruses. The non-financial reports are public reports available on the internet at all times to everyone. There is thus no risk of data loss which strengthens the reliability of the report.

### 3.6 Trustworthiness

The trustworthiness of the study is connected to the validity, credibility and reliability of the information.

#### 3.6.1 Validity and reliability

There are 24 selected companies from many different industrial branches in this report where all firms are Large Cap companies on the Swedish Stock Market. There should not be any bias regardless of which companies NFR's were selected for this study. Validity of this report refers to that there would not have been any difference in the results if the other 73 companies NFR's (those remaining from the 97 original companies after 24 companies had been selected).

The results of this report have been compared with previous research which adds to the validity of the report.

In this study, the entire method is described in detail in order to strengthen its reliability. The ambition was to make the method transparent and open to rigorous examination thereby strengthening the reliability of the study (Saunders, Lewis & Thornhill 2009; Bell, Bryman & Harley 2019). If another researcher attempts to replicate the study, (s)he is supposed to get the same results, otherwise the study is unreliable.

### 3.7 Ethical considerations

One of the key stages where ethical problems could have arisen in this study was when looking for access to data (Saunders, Lewis & Thornhill 2009). The documents required for this study were all freely available on the internet so gaining information and gatekeeper problems were avoided. Ethical principles in business research involves four main areas (Bell, Bryman & Harley 2019) and these were taken into consideration in this study as follows:

- i. There was no harm to participants (Saunders, Lewis & Thornhill 2009) as the population was companies. These companies have publically released the NFRs and as such have carefully weighed up the information that they have made available for public scrutiny.
- ii. The information used in the study was publically available information on the internet so no consent needed to be given.
- iii. There was no invasion of privacy as the information is publically available information.
- iv. Transparency permeated the entire process so there was no deception involved.

### 3.8 Delimitations of the study

- i. Delimitation 1: Focus on the environmental perspective

Given that the NFRs have a broad scope, one of the delimitations is the focus on the environmental dimension within the NFRs, the UNSDG 13 “Climate Action” – Take urgent action to combat climate change and its impacts (UN 2020a) – and emissions and how they are measured. This delimitation is motivated by the importance of the effect of global warming on the planet and the impact that companies’ activities have on this issue.

- ii. Delimitation 2: Focus on Large Cap companies on the Swedish Stock Market.

The companies are Large Cap companies on the Stockholm Stock Market (Di 2020). The reason for choosing these companies was that they fulfilled the criteria set out by the Council Directive 2014/95/EU, which refers to those companies that are required by the EU to produce a non-financial report. This scope excludes small and medium sized companies thus these firms are not addressed in this study. It can however be assumed that small and medium sized companies report on environmental issues in order to satisfy their investors and stakeholders. The geographical range is companies in Sweden where the Council Directive 2014/95/EU has legal jurisdiction as Sweden is a member of the EU. The selected companies are within the same socio-economic context and thus subjected to the same pressure to respond to stakeholder demands and to comply with the rules and regulations.

- iii. Delimitation 3: Focus on the last ten years

The last ten years have seen changes in the way the Climate issue is measured and addressed by enterprises from both a legal and voluntary perspective. Examples of this are the introduction of the Scope 3 standard of the GHG protocol in 2011, the introduction of the UNSDG in 2015 and more specifically UNSDG 13 “Climate Action” as well as more recently the coming into force of the EU Directives Council Directive 2014/95/EU and Council Directive 2017/C215.

## 4 Results

In this chapter the data gathered are presented in accordance with the levels presented in the Analysis model: Frameworks used by the companies when drawing up the NFR and the indicators, units of measurement and physical quantities that were used by the companies when measuring for climate change are presented. Brief summarizing comments and observations are also presented adjacent to the different levels. More general results in some cases with figures are provided where appropriate. Please refer to Appendix K, L, M and N.

### 4.1 Frameworks

The results of the frameworks recommended in the EU Directive that are used by the 24 selected companies over a decade are given in Tables 3, 4, 5 and 6 below. Some relevant results will also be given on the GHG Protocol due to its importance as a framework in the preparation of NFRs. The GHG Protocol is not a recommended framework in the EU Directive.

#### 4.1.1 GRI

Please see Table 3 for a detailed list of the GRI framework used by companies over a decade.

Table 3. The use of GRI by companies over a decade.

GRI	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
Assa Abloy	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
Astra Zeneca										
AAK	GRI		GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
Boliden	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
Oriflame Holding				GRI	GRI	GRI	GRI	GRI	GRI	GRI
Ericsson	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
Fenix Outdoor Int.	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
Alfa Laval	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
Axfood	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
Elektrolux	GRI	GRI	GRI	GRI		GRI	GRI	GRI	GRI	GRI
ICA Group	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI		
H&M	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
Husqvarna	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
JM			GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
Kinnevik	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
NCC	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
Securitas			GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
Sandvik	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
SSAB	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
Stora Enso	GRI	GRI	GRI	GRI	GRI	GRI	GRI		GRI	GRI
Swedish Match	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI		
Skanska									GRI	GRI
Volvo	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
Total	19	15	19	21	20	21	21	20	22	21



## Comments

- Three companies are not using GRI in 2019.
- One company, Astra Zeneca, has never used GRI as a framework.
- Two companies have recently stopped using GRI as a framework after having used the GRI framework over many years - ICA Group in 2019 and Swedish Match in 2018
- Eleven companies have used GRI continuously over the ten years.
- Skanska commenced using GRI in 2018.

## 4.1.2 UNGC

Please see Table 4 for a detailed list of the UNGC framework used by companies over a decade.

Table 4. The use of UNGC by companies over a decade.

UNGC	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Assa Abloy	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Astra Zeneca	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
AAK	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Boliden	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Oriflame Holding	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Ericsson	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Fenix Outdoor Int.	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Alfa Laval	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Axfood	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Elektrolux	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
ICA Gruppen	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
H&M	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Husqvarna	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
JM	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Kinnevik	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
NCC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Securitas	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Sandvik	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
SSAB	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Stora Enso	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Swedish Match	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Skanska	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Volvo	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
Total	24	24	24	24	24	24	24	24	24	24

## Comments

- All company have used UNGC continuously over the last decade in their NFR.

#### 4.1.3 UNSDG

Please see Table 5 for a detailed list of the UNSDG framework used by companies over a decade.

Table 5. The use of UNSDG by companies over a decade.

UNSDG	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
Assa Abloy						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
Astra Zeneca						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
AAK						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
Boliden						UNSDG	UNSDG		UNSDG	UNSDG
Oriflame Holding						UNSDG	UNSDG		UNSDG	UNSDG
Ericsson								UNSDG		UNSDG
Fenix Outdoor Int.										
Alfa Laval						UNSDG	UNSDG		UNSDG	UNSDG
Axfood						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
Elektrolux						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
ICA Group							UNSDG	UNSDG	UNSDG	UNSDG
H&M						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
Husqvarna								UNSDG		UNSDG
JM						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
Kinnevik								UNSDG	UNSDG	UNSDG
NCC							UNSDG	UNSDG	UNSDG	UNSDG
Securitas								UNSDG	UNSDG	UNSDG
Sandvik						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
SSAB							UNSDG	UNSDG	UNSDG	UNSDG
Stora Enso							UNSDG	UNSDG	UNSDG	UNSDG
Swedish Match										UNSDG
Skanska							UNSDG	UNSDG	UNSDG	UNSDG
Volvo							UNSDG	UNSDG	UNSDG	UNSDG
Total	0	0	0	0	0	12	18	19	20	23

#### Comments

- Twelve companies started to use UNSDG in their 2015 NFRs when it was introduced.
- UNSDG is used by 23 companies in the 2019 NFR.
- The firm Fenix Outdoor Int. has stated in its 2019 NFR that they have plans to introduce UNSDG into their non-financial report.

#### 4.1.4 CDP

Please see Table 6 for a detailed list of the CDP framework used by companies over a decade.

Table 6. The use of CDP by companies over a decade.

CDP	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Assa Abloy	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Astra Zeneca						CDP	CDP	CDP	CDP	CDP
AAK										
Boliden			CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Oriflame Holding	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP		
Ericsson	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Fenix Outdoor Int.				CDP	CDP	CDP	CDP	CDP		
Alfa Laval	CDP	CDP		CDP	CDP					
Axfood AB						CDP	CDP	CDP	CDP	CDP
Elektrolux	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
ICA Group									CDP	CDP
H&M	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Husqvarna	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
JM	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Kinnevik	CDP								CDP	CDP
NCC	CDP	CDP	CDP			CDP		CDP		
Securitas	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	
Sandvik	CDP			CDP	CDP	CDP	CDP	CDP	CDP	CDP
SSAB	CDP	CDP	CDP	CDP	CDP					CDP
Stora Enso	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Swedish Match	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Skanska	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Volvo					CDP	CDP	CDP	CDP	CDP	CDP
Total	17	15	15	17	18	19	18	19	18	18

#### Comments

- Ten companies that have used the CDP continuously over the decade are ABB, Assa Abloy, Ericsson, Electrolux, H & M, Husqvarna, JM, Securitas, Stora Enso, Swedish Match and Skanska.
- AAK has never been CDP rated.
- Five companies have used CDP primarily under the decade and these are Securitas, SSAB, Sandvik, Oriflame Holding and Boliden.
- Seven companies have used the CDP frameworks sporadically over the decade and these are Fenix Outdoor Int., Alfa Laval, Kinnevik, NCC, Axfood, ICA Group and Volvo.
- Seven companies have not used CDP in 2019.
- Information for Table 6 originates from the individual company's homepage and CDP homepage score (CDP 2020).

#### 4.1.5 General results

Within some of the frameworks, for example GRI and UNSDG, greenhouse gas (GHG) emissions are used to measure the climate change issue. The companies can measure for three GHG Scopes, 1, 2 and 3 of emissions (see section 2.3.2 5A & Appendix J). Please refer to Table 7 where the results of the different Scopes that the 24 selected companies are measuring for in their NFRs for 2019 are given.

Table 7. The different Scopes of GHG emissions used by the selected companies in their NFRs in 2019

GHG	No Scope	Scope 1 & 2	Scope 1,2 & 3
Companies	1	6	17

#### 4.2 Indicators

The indicators used by the companies over the last ten years are seen in Tables 8, 9 and 10.

##### 4.2.1 GHG

Please see Table 8 for a detailed list of the GHG indicator used by companies over a decade.

Table 8. The use of the indicator GHG by all 24 companies over a decade.

GHG	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Assa Abloy	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Astra Zeneca	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
AAK	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Boliden	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Oriflame Holding	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Ericsson	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Fenix Outdoor Int.	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Alfa Laval	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Axfood AB	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Elektrolux	GHG	GHG	GHG		GHG	GHG	GHG	GHG	GHG	GHG
ICA Group	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
H&M	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Husqvarna	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
JM	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Kinnevik							GHG	GHG	GHG	GHG
NCC	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Securitas					GHG	GHG	GHG	GHG	GHG	GHG
Sandvik	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
SSAB	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Stora Enso	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Swedish Match	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Skanska	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Volvo	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
Total	22	22	22	21	23	23	24	24	24	24

## Comments

- GHG is a commonly used indicator by nearly all companies over the decade.
- Kinnevik started using GHG indicator in 2016 and Securitas in 2014.

## 4.2.2 CO2

Please see Table 9 for a detailed list of the CO2 indicator used by companies over a decade.

Table 9. The use of the indicator CO2 by all 24 companies over a decade.

CO2	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Assa Abloy	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Astra Zeneca	CO2	CO2			CO2	CO2				
AAK	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	
Boliden	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Oriflame Holding	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Ericsson	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Fenix Outdoor Int.	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Alfa Laval	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Axfood	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Elektrolux	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
ICA Group	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
H&M	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Husqvarna	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
JM	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Kinnevik	CO2	CO2				CO2	CO2	CO2	CO2	CO2
NCC		CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Securitas	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Sandvik	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
SSAB	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Stora Enso	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Swedish Match	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Skanska	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Volvo	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Total	23	24	22	22	23	24	23	23	23	22

## Comments

- CO2 is used by the majority of the selected companies over the decade.
- Astra Zeneca is the only company who has not regularly used CO2 as an indicator.

#### 4.2.3 C

Please see Table 10 for a detailed list of the C indicator used by companies over a decade.

Table 10. The use of the indicator C by all 24 companies over a decade.

C	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB	C	C	C	C	C	C	C	C	C	C
Assa Abloy	C	C	C	C	C	C	C	C	C	C
Astra Zeneca	C	C	C	C	C	C	C	C	C	C
AAK			C	C						
Boliden										C
Oriflame Holding		C	C	C	C	C				
Ericsson	C	C	C	C	C	C	C	C	C	C
Fenix Outdoor Int.				C	C	C	C	C	C	C
Alfa Laval								C	C	C
Axfood										
Elektrolux	C	C	C				C	C	C	C
ICA Group									C	C
H&M	C	C	C	C	C	C	C	C	C	C
Husqvarna							C	C	C	C
JM										
Kinnevik										
NCC	C	C	C	C	C	C	C	C	C	C
Securitas										
Sandvik							C	C	C	C
SSAB				C	C	C	C	C	C	C
Stora Enso	C	C	C	C	C	C	C	C	C	C
Swedish Match										
Skanska	C	C	C	C	C	C	C	C	C	C
Volvo	C	C	C	C	C	C	C	C	C	C
Total	10	11	12	13	12	12	14	15	16	17

#### Comments

- The C indicator is not as commonly used as the other indicators by the companies.
- Five companies have not used C as an indicator. These are Axfood, JM, Kinnevik, Securitas and Swedish Match.
- Nine companies have continuously used C as an indicator over the decade. These companies are ABB, Assa Abloy, Astra Zeneca, Ericsson, H & M, NCC, Stora Enso, Skanska and Volvo.
- The remaining ten companies sporadically used C as an indicator over the last decade.
- Out of all three indicators the indicator C was responsible for the highest increase in use over the decade being used by seven more companies in 2019 compared to 2010.

### 4.3 Units of measurement

The units of measurement measured in this study were directly connected to the emission figures in the company's NFR and results are shown in Tables 11, 12, 13 and 14 below.

#### 4.3.1 CO2

Please see Table 11 for a detailed list of the CO2 units of measurement used by companies over a decade.

Table 11. The unit of measurement, CO2 used by all 24 companies over a decade.

CO2	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB										
Assa Abloy	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Astra Zeneca						CO2				
AAK	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	
Boliden	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Oriflame Holding										
Ericsson										
Fenix Outdoor Int.		CO2	CO2	CO2	CO2					
Alfa Laval	CO2	CO2								
Axfood	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2		
Elektrolux	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
ICA Group	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
H&M										
Husqvarna	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
JM	CO2	CO2	CO2	CO2	CO2					
Kinnevik	CO2	CO2					CO2	CO2	CO2	CO2
NCC										
Securitas	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Sandvik	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
SSAB	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Stora Enso										
Swedish Match	CO2	CO2	CO2	CO2	CO2	CO2				
Skanska										
Volvo	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Total	15	16	14	14	14	13	12	12	11	10

#### Comments

- Nine companies have used CO2 as a unit of measurement continuously over the last decade. These companies are Assa Abloy, Boliden, Electrolux, ICA Gruppen, Husqvarna, Securitas, Sandvik, SSAB, Stora Enso and Volvo.
- Seven companies have not used CO2 as a unit of measurement at all over the last decade. These companies are ABB, Oriflame Holding, Ericsson, H&M, NCC, Stora Enso and Skanska.
- The remaining eight companies have at different times used CO2 as a unit of measurement where Astra Zeneca has used it only once during the entire ten years.

- Please refer to Table 12 to see climate change emission figures over ten years for the Volvo company. These figures allow the reader to follow an increase or decrease in the level of emissions declared in the firms NFRs over the decade.

Table 12. Climate change emissions using the unit of measurement CO<sub>2</sub> in Volvo's NFR over ten years.

CO <sub>2</sub>	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Volvo	279	255	235	280	231	221	407	399	421	324

#### 4.3.2 CO<sub>2</sub>e

Please see Table 13 for a detailed list of the CO<sub>2</sub>e units of measurement used by companies over a decade.

Table 13. The unit of measurement CO<sub>2</sub>e used by all 24 companies over a decade.

CO <sub>2</sub> e	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB	CO <sub>2</sub> equivalent	CO <sub>2</sub> equivalent	CO <sub>2</sub> equivalent	CO <sub>2</sub> equivalent	CO <sub>2</sub> equivalent	CO <sub>2</sub> equivalent	CO <sub>2</sub> equivalent	CO <sub>2</sub> equivalent	CO <sub>2</sub> equivalents	CO <sub>2</sub> equivalents
Assa Abloy										
Astra Zeneca	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
AAK										CO <sub>2</sub> e
Boliden										
Oriflame Holding	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
Ericsson	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
Fenix Outdoor Int.			CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
Alfa Laval			CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
Axfood					CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
Elektrolux						CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	
ICA Group						CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
H&M	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
Husqvarna				CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
JM						CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
Kinnevik								CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
NCC		CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
Securitas				CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
Sandvik										
SSAB								CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
Stora Enso	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
Swedish Match							CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
Skanska	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e	CO <sub>2</sub> e
Volvo										
Total	7	8	10	12	13	16	17	19	19	19

#### Comments

- Seven companies have continuously used CO<sub>2</sub>e as a unit of measurement over the decade and these are ABB, Astra Zeneca, Oriflame Holdings, Ericsson, H&M and Stora Enso and Skanska



- Four companies have never used CO<sub>2</sub>e as a unit of measurement, Assa Abloy, Boliden, Sandvik and Volvo.
- The main concentration of the use by the companies of CO<sub>2</sub>e as a unit of measurement occurs after 2015.
- AAK has only used CO<sub>2</sub>e unit of measurement once over the ten years.
- Please refer to Table 14 to see emission figures for the company Stora Enso. These figures allow the reader to follow an increase or decrease in the level of emissions declared in the firms NFRs over the decade.

Table 14. Climate change emissions for Stora Enso over ten years.

CO <sub>2</sub> e	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Stora Enso	9.58	8.81	11.26	11.21	12.23	11.28	10.47	10.58	11.44	10.46

#### 4.4 Physical quantities

When a unit of measurement such as CO<sub>2</sub> is given a number, this number is expressed in a physical quantity such as ton or kton. Please see Table 15 for a detailed list of the different physical units used by companies over a decade.

Table 15. The physical quantities used by all 24 companies over a decade in the NFRs.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB	kiloton	kiloton	kiloton	kiloton	kiloton	kiloton	kiloton	kiloton	kiloton	kiloton
Assa Abloy	Tonne	Tonne	Tonne	Tonne	Ton	Ton	Ton	Ton	Ton	Ton
Astra Zeneca	Million tonne	Million tonne	Million tonne, Kilo tonne Thousand tonne, Tonne, Kt	Tonne, Thousand tonne, Kt	Metric tonne, Tonne, Thousand tonne, Kt	Tonne, metric tonne, Kt	Metric tonne, Tonne, Kt	Metric tonne, Tonne, Kt	Kt, Tonne	Kt, Tonne
AAK	MT	MT	MT	MT	MT	MT, ton	MT, ton	MT, ton	MT, ton	Ton
Boliden	Tonne	Tonne	Tonne	Tonne, Mtonne	Tonne, Mtonne	Tonne, Mtonne	Mtonne, tonne	Mtonne	Mtonne, t, Tonne	Million metric ton, metric ton
Oriflame Holding	Tonne	Tonne	Tonne	Tonne	t	t	t	t	t	t
Ericsson	Ktonne, MTonne	Ktonne, MTonne	Ktonne, MTonne	ktonne, MTonne	Ktonne, MTonne	Ktonne, MTonne	Ktonne, MTonne	Ktonne, MTonne	Ktonne, MTonne	Ktonne, MTonne
Fenix Outdoor Int.		Ton	t	T, Ton	T, Ton	t	t	t	t	T, metric ton
Alfa Laval	Ton	Ton	Tonne	Tonne	Tonne	Tonne	Tonne	Tonne	Tonne	Tonne
Axfood	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
Elektrolux	Ton	Ton	Tonne	Tonne	Tonne	Tonne	Ton	Tonne, ktonne, t, Ton	metric kton	metric ton
Ica Group	Ton	Ton	Ton	Tonne	Tonne	Tonne	Tonne	Tonne	Tonne	Tonne
H&M	t	t	Tonne	Tonne	Tonne	Tonne	Tonne	Tonne	Tonne	Kt, tonne
Husqvarna	Ton, metric ton	Ton, metric ton	Tonne, metric ton	Tonne	Tonne, ktonne	Tonne, ktonne	Tonne, t, metric ton, Ton	T, Tonne	T, Tonne	T, ton, Tonne
JM	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
Kinnevik	Tonne	Ton					Tonne	Tonne	Tonne	Tonne
NCC	Ton	Ton 000	Ton 000	Ton 000	Tton, Ton 000	Tton, Ton 000	Tton, ton 000	Tton, Ton 000	Tton, tonnes, Tons 000	Tton, tonnes, Tons 000

									Ton 000	
Securitas	Gram/ km	Gram/ km	Gram/ km	Tonnes, Gram/ km	Tonnes, Gram/ km	Gram/ km	Gram/ km		Ton, Gram/ km	Tonne Gram/ km
Sandvik	tMetric ton	tMetric ton, Ton	Tons, tmetric tons	tton	Ton	Ton	Ttons, Ton	Ton, tton	Tons, tton	Tons, ttons, kton
SSAB	Million ton, Ton, kton	Ton, kton	ktonne	ktonne	ktonne	ktonnes	ktonne	t	t	kton
Stora Enso	Million ton, million tonne, Tonne	Million ton, million tonne, Tonne	Million ton, million tonne, Tonne	Million ton, million tonne, Tonne	Million tonne, Tonne	Million tonne, ktonne	Million tonne, Tonne	Million tonne, Tonne	Million tonne	Million tonne
Swedish Match	Ton, metric ton	Metric ton, Ton	Metric ton	Metric ton	Metric ton	Metric ton	Metric ton, Ton	Metric ton, Ton	Metric ton, Ton	
Skanska	Metric ton, t	Metric ton, Tonne, t	metric ton, Tonne, t	Metric ton	Metric ton	Tonne	Ton	Ton, Tonne	Tonne	Tonne
Volvo	1000 ton	1000 ton	1000 ton	1000 ton	1000 ton	1000 ton, t, Tonne, metric tonne	1000 ton	1000ton	1000ton	Kton, Mton, 1000 ton
Total	13	12	14	13	13	13	13	14	15	13

#### Comments

- Four of the companies have used a physical quantity consistently over the entire decade. These companies are ABB, Ericsson, Stora Enso and Volvo.
- The majority of companies have used a wide variety of physical quantities over the last ten years.
- The expression of this wide variety of physical quantities may be in some cases due to a mixing up of the terms by companies such as the physical quantities tonne and ton when measuring for climate change. This makes the reading and analyzing of the NFRs laborious and consequently direct comparison of NFRs difficult.

## 5 Analysis & discussion

The analysis of the comparability of NFRs is carried out using an Analysis model comprising four components which are frameworks, indicators, units of measurement and physical quantities. At each of these levels, it is asked whether there is a direct comparability of these components in the NFR (i) within a single company over time, (ii) between companies over time, and (iii) if a change has occurred over the decade due to regulations. Some figures are given. The results are compared with previous research.

Please refer to Appendix M, Tables 11, 12, 13, 14, 15, 16 and 17 where it can be seen that some companies are consistently using a unit of measurement and a physical quantity over the entire ten years. These companies, with the unit of measurement and physical quantity respectively in brackets are ABB (CO<sub>2</sub>e and Kiloton), Ericsson (CO<sub>2</sub>e and Ktonne), Stora Enso (CO<sub>2</sub>e and million tonne) and Volvo (CO<sub>2</sub> and 1000 ton). Tables 16 and 17 highlight that all four companies are using different physical quantities. With regard to units of measurement three of the companies are using CO<sub>2</sub>e and one company CO<sub>2</sub>. Tables 16 and 17 also provide figures for two companies' emissions, Stora Enso and Volvo.

Table 16. Climate change emissions from 3 companies NFRs over ten years with unit of measurement CO<sub>2</sub>e.

CO <sub>2</sub> e	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Stora Enso (Million tonne)	9.58	8.81	11.26	11.21	12.23	11.28	10.47	10.58	11.44	10.46
ABB (Kiloton)	Kiloton	Kiloton	Kiloton	Kiloton	Kiloton	Kiloton	Kiloton	Kiloton	Kiloton	Kiloton
Ericsson (Ktonne)	Ktonne	Ktonne	Ktonne	Ktonne	Ktonne	Ktonne	Ktonne	Ktonne	Ktonne	Ktonne

Table 17. Climate change emissions from Volvo's NFR over ten years with the unit of measurement CO<sub>2</sub>.

CO <sub>2</sub>	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Volvo (1000 ton)	279	255	235	280	231	221	407	399	421	324

With reference to Table 16 and 17 an analysis shows that four of the 24 selected companies' NFRs in this study could be directly compared over ten years for climate change. None of the 24 selected companies' NFRs can be directly compared between the different companies over the timeframe studied.

### 5.1 A comparison of the frameworks used in the NFR presentation

The different frameworks used by the companies internally and between companies over time are identified and analyzed in the following sections.

#### 5.1.1 Comparison of frameworks used within single companies over time

Please refer to Appendix K, Tables 3 & 4, 5, 6 and 18 where it can be seen that the majority of the 24 companies consistently use GRI and UNGC frameworks over the decade.

The Tables also shows that three of the 24 companies, ABB, Assa Abloy and H & M, have each used the same frameworks UNGC, GRI and CDP for the entire ten years. These

companies have also used UNSDG framework over the five years since its introduction in 2015.

Table 18. The different frameworks used by some companies in a decade (an excerpt from Appendix K).

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Assa Abloy	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP

From Table 18 and Appendix K the reader can see that the frequent use of the same frameworks by companies is an indication that there is comparability of NFRs on a framework level. This however can be questioned as it should be noted that despite using the same frameworks over time, ABB is the only company out of these three, ABB, Assa Abloy and H&M, where “Climate Action” and emissions can be measured and directly compared internally in the NFR over the entire ten year period (see section 5 above). Consequently, the mere fact that a company is consistently using a certain framework does not guarantee direct internal comparability over time.

Appendix K and Tables 3, 4, 5 and 6 also show the companies that are inconsistently using frameworks over the ten years. For example Oriflame Holding does not use GRI for the first three years from 2010 to 2012. JM and Securitas do not use GRI in the years 2010 and 2011. ICA Group and Swedish Match do not use GRI in 2018 and 2019. Skanska are using GRI in 2018 and 2019. With regard to the UNSDG, 14 of the companies have not used the framework consistently since its introduction in 2015 where one company, Fenix Outdoor Int., has never used UNSDG as a framework. CDP is another framework that many companies are inconsistently using over the ten years. Astra Zeneca and Axfood AB do not use the CDP framework from 2010 to 2014, Volvo does not use the framework from 2010 to 2013, AAK has never used CDP, Kinnevik used CDP in 2010 and then again in 2018 and 2019. At the framework level of analysis it is difficult to see any connection between the inconsistent use of frameworks and the comparability of the NFRs over time.

#### 5.1.2 A comparison of frameworks used between different companies

This study has shown, that despite the many different frameworks to choose from, approximately 21 in number as laid out in the EU Directive, the majority of the 24 companies commonly use GRI, UNGC, CDP and UNSDG frameworks. With reference to Diagram 1, Tables 3, 4, 5 & 6 and Appendix K, it can be seen that in 2010, at the beginning of the study period, three frameworks were used by the 24 selected companies when preparing NFRs. However this number of frameworks increased to four in 2015 when the UNSDG framework was launched.

The only framework used consistently by all companies over the ten years is UNGC. The majority of the companies have continuously made use of four different frameworks when preparing NFRs regardless of branch. The different branches in which the companies are operating are business services, food production (2), retail (2), data, IT & telecommunication, wholesale (3), construction, design & interior design (3), motor vehicle trade, electronics, metal (3 firms), mining, paper and stationary, manufacturing (2 firms), machines, pharmaceutical and household appliances. The variety of branches suggests that there is no clear link between branch and use of a specific framework where all companies use the same frameworks independent of branch.

The other three frameworks, GRI, CDP and UNSDG, are inconsistently used by the different companies. It can be noted that Astra Zeneca has not used GRI over the entire ten years, AAK has not used CDP and Fenix Outdoor Int. has not used the UNSDG framework over the decade. The latter company has expressed its intention to implement the UNSDG in the near future. This indicates the effect of a mimetic pressure on the company to follow other companies' practices as the UNSDGs are not legally binding and not around long enough to be the norm.

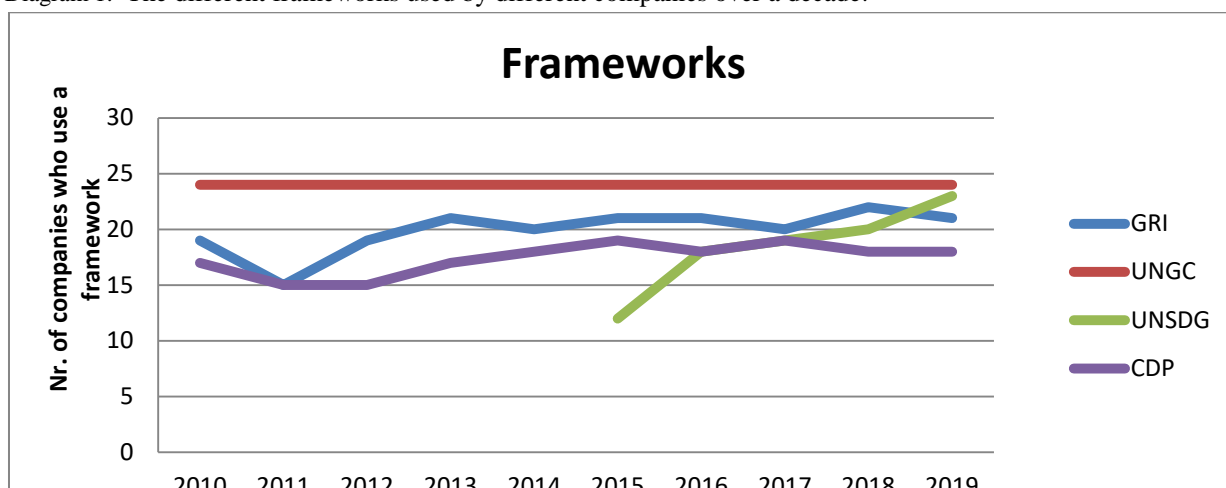
Five companies, Astra Zeneca, Oriflame Holding, JM, Securitas and Skanska, did not use GRI in 2010 whereas three companies, Astra Zeneca, ICA Group and Swedish Match, did not use GRI in 2019. Only one of these companies was the same, Astra Zeneca. This means that some companies, ICA Gruppen and Swedish Match, that were using GRI in 2010 have stopped using it in 2019. This could be an indication that these companies were dissatisfied with the framework. The companies, Oriflame Holding, Securitas and Skanska were not using GRI in 2010 but were using it in 2019. This could indicate a mimetic effect of the other large companies on these companies.

With regard to the UNSDG, 12 companies were using the framework in 2015 and this number increased to 23 companies in 2019, thus UNSDG has become a popular framework to use by the companies in a short period of time.

The CDP framework was used by 17 companies in 2010 and 18 companies in 2019. CDP is thereby, the most inconsistently used framework.

At the framework level of analysis it is difficult to see any connection between the consistent or inconsistent use of frameworks and the comparability of the NFRs between companies.

Diagram 1. The different frameworks used by different companies over a decade.



### 5.1.3 Comparing with previous research on the use of frameworks in NFR preparation

#### i. The use of different frameworks

In this study, the 24 selected companies used a total number of four different frameworks when preparing their NFRs. Observations in previous research have also shown that there is no universally accepted accountability tool/framework for companies to use when reporting on their non-financial impacts (Ranganathan 2017).

This study has shown that very few of the 24 selected companies' NFRs are directly comparable over a decade. It is indicated in previous research which is primarily focused on non-Swedish companies, that there is a problem with the comparability of NFRs (Hahn & Kühnen 2013; Boiral & Henri 2015; Diouf & Boiral 2017; Braam & Peeters 2018). There are indications that non comparability of NFRs is connected to the use of too many frameworks where previous research has shown that different frameworks compete and undermine the comparability of NFRs (La Torre et al. 2018).

#### ii. The use of GRI as a framework

This study has shown that in 2018 the ICA Group stopped using GRI in their 2018 NFR, after having used it continuously since 2010. This is interpreted as a sign of dissatisfaction and a critique of the GRI framework.

The majority of companies in this study use the GRI framework. This framework has in previous research been associated with problems connected to NFR preparation over the years (Dragomir 2011; Hahn & Kühnen 2013; Goicoechea, Gómez-Bezares & Ugarte 2019). Boiral & Henri (2015) found that despite the fact that all companies used the same GRI framework when drawing up the NFR, it was impossible to compare the reports as the provided information cannot be trusted. This results in a credibility gap and mistrust toward the non-financial information provided by the organization (Boiral & Henri 2015).

The 24 selected companies in this study come from many different branches. This can contribute to the preparation of a variety of NFRs prepared by firms, something which has

been shown in previous research. For example, when comparing different sectors, the flexibility provided by GRI guidelines leads to a greater variety of reports, resulting in difficulties in comparing these reports (Zsóka & Vajkai 2018).

Another problem connected to the GRI framework is the continuous update of the framework. One example is the introduction of GRI 4 in 2016 (Manes-Rossi et al. 2018). The different updates can make it difficult to compare NFRs from one year to another.

### iii. Unreliable and non transparent information

This study has shown that information presented in the non-financial report can give a false signal and be misleading where all the emissions that the company is directly or indirectly responsible for are not presented in the NFR.

Please refer to section 4.1.5 above, Table 7 for results of the different GHG Scopes used by firms. The analysis of the results shows that seven companies do not measure Scope 3 GHG emissions in the 2019 NFRs. Six of the companies are Assa Abloy, AAK, Boliden, Ericsson, Husqvarna and Sandvik. The seventh company is Oriflame Holdings, a firm that does not measure any of GHG Scope 1, 2 or 3 for emissions. These seven companies, considering the size of the firms and their global span, are likely to be using 3PL (Third-Party logistics) providers for transport. Such practice makes them indirectly contributing to Scope 3 emissions and they should therefore be measuring and declaring them. By not doing so, companies are communicating a false signal to the stakeholders. Similarly, a false signal is provided when a company is measuring for Scope 3 emissions but not declaring them.

There are practical examples of incorrect emission figures provided by some of the selected firms in this study, two of which are being addressed here. One company is Stora Enso (see Table 16 above). A major portion of this company's GHG emissions are Scope 3 where the company estimates that 71 % of the emissions are found in the supply chain. Of this 71 %, transportation accounts for 20 %, further processing of the company's products by customers for 43% while the remaining 37 % is attributed to the sourcing and manufacturing of raw materials. Part of these Scope 3 emissions is connected to generating coal-based energy at Beihai Mill in China. When comparing the companies' emissions in the NFRs there are unexplained discrepancies in the figures given from one year to another. This makes it difficult to directly compare this companies' emission internally and between companies over time. It can be argued that companies need to use a framework in a manner that provides figures that are reliable and can be directly compared over time. In order to monitor and reduce emissions the use of frameworks should be explicitly instructive and required through regulations.

Another example is Volvo. Please refer to Table 17 above where a change can be seen in the emission figures between the years 2015 and 2016 in the near doubling of Volvo's Climate affecting emissions from 221 (1000 ton) to 407 (1000 ton). The rise in figures is due to the fact that the company only started to measure for Scope 2 emissions in 2016. Furthermore, Volvo is an example of a company that has measured to some extent for Scope 3 emissions

but not included the figures in the NFR. Volvo stated in their 2019 NFR that the company has not reported the total Scope 3 emissions due to a “lack of standards that enable comparable results within the industry” (Volvo Ltd, 2020). Volvo’s decision to omit the correct emission figures further exemplifies the need for stricter and instructive regulations.

Previous research has shown that organizations that have produced a GRI framework-based report are not as sustainable as they declare on such issues as gas emissions (Moneva, Archel & Correa 2006).

By not providing all information in the NFR, a company is giving a false signal to the reader. This is something that has been pointed out in previous research where a false signal can be given by a firm of the unobservable activities within the firm (Connelly et al. 2011). These activities could refer to where the company is not measuring for Scope 3 GHG emissions or that the company is measuring for Scope 3 emissions but not declaring them in their NFRs thus giving a false signal.

Frameworks in their present form allow for companies to omit emission figures that are vital to the correct analyses of climate change, which in turn contributes to a credibility gap and an understandable lack of confidence in the content of the NFR. Regulations must be put in place to assure that the frameworks are used in an appropriate manner.

## 5.2 A comparison of the indicators used in the NFRs

When measuring for climate change, an indicator is often used when the observed phenomenon cannot be directly calculated.

### 5.2.1 Comparison of indicators used within single companies over time

With reference to Appendix L and Tables 8, 9, 10 and 19 there are three indicators used by a company when measuring for climate change. These indicators are GHG, CO<sub>2</sub> and C where GHG and CO<sub>2</sub> are the most consistently used.

Please refer to Appendix L, Tables 8, 9, 10 and 19 where it can be seen that many companies have frequently used the three different indicators over the ten year period. The GHG indicator and the CO<sub>2</sub> indicator have been used consistently by 21 of the companies since 2010 while the indicator C has consistently been used by 9 companies since 2010.

The Appendix and Tables also show that 7 of the companies use all three indicators consistently over the ten years. These companies are ABB, Assa Abloy, Ericsson, H&M, NCC, Stora Enso, Skanska and Volvo. The reader can see that the frequent use of the same indicators by companies is an indication that there is comparability of NFRs on an indicator level. This however can be questioned as it should be noted that despite using the same indicators over time, ABB, Ericsson, Stora Enso and Volvo are the only companies out of the above mentioned seven that are comparable over time where climate change can be measured and directly compared internally in the NFR over the entire ten year period (see section 5



above). Consequently, the mere fact that a company is consistently using a certain indicator does not guarantee direct internal comparability over time. Furthermore, it is worth noting that none of these four companies used the frameworks (see Diagram 1 and Tables 3, 4, 5 & 6) in the same manner. This indicates that the suitability of a certain framework may depend on which indicators are included in the framework.

Table 19. The different indicators used by some companies in a decade (an excerpt from Appendix L).

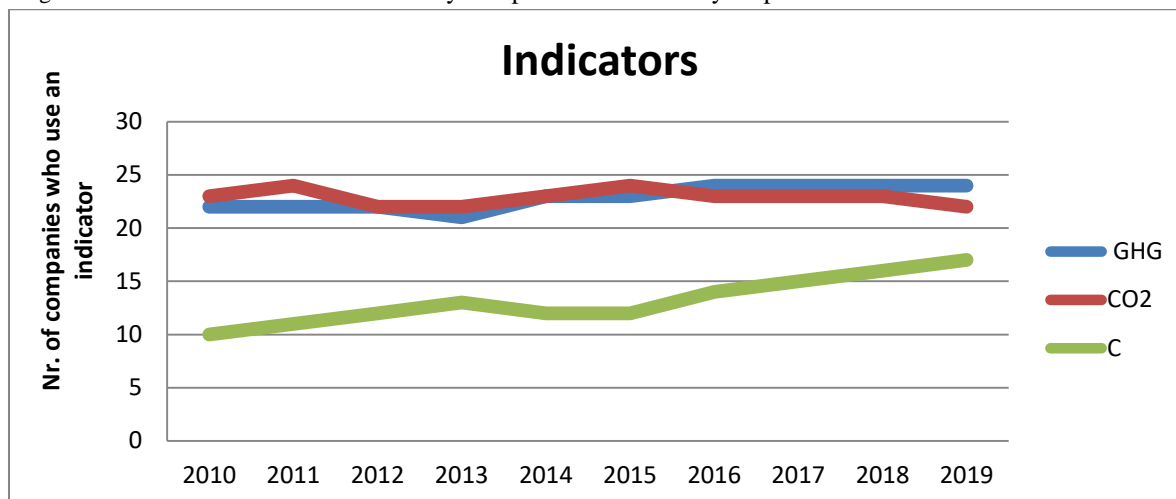
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>ABB</b>										
GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
C	C	C	C	C	C	C	C	C	C	C
<b>Assa Abloy</b>										
GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
C	C	C	C	C	C	C	C	C	C	C

It can be seen from Appendix L, Table 8, 9 and 10 which companies that are inconsistently using indicators over the ten years. Kinnevik has been using the indicator CO2 over seven years and GHG over four years. Securitas has used GHG from 2014 and onwards. Astra Zeneca has used the indicator CO2 four times in the past ten years. AAK and ICA Group have used the indicator C for two of the ten years, Husqvarna, and Sandvik have used C for four of the ten years, Boliden has used the C indicator once in the ten years, Oriflamme Holding and Alfa Laval used C, 5 and 3 times respectively in the decade and Electrolux and SSAB used the indicator C seven times in the ten years. The indicator C has not been used at all over the ten years by Kinnevik and four other companies, Axfood AB, JM, Securitas and Swedish Match. At the indicator level of analysis it is difficult to see any connection between the inconsistent use of indicators and the comparability of the NFR's over time.

Regardless of the consistent or inconsistent use of indicators by firms, one company, Astra Zeneca, have declared that too many indicators can lead to confusion in the company when it comes to measuring for climate change. The company declared in their 2018 non-financial report that the majority of their operational GHG emissions originate from non-CO2 sources and thus decided that CO2 was not a suitable indicator for the company to use. The firm has changed its focus to GHG as the main indicator to be used in the NFR. This illustrates that companies may have a different view on what indicator is appropriate when measuring for climate change.

Contrary to what was indicated earlier, there could not be an absolute connection between the consistent use of indicators and direct comparability of NFRs. Since neither the frameworks nor the indicators alone seem to determine the direct comparability of NFRs, this must be decided by other factors.

Diagram 2. The different indicators used by companies under a ten year period.



### 5.2.2 A comparison of indicators used between different companies

The different indicators used by the selected companies when preparing an NFR can be seen in Appendix L, Diagram 2 and Tables 8, 9, 10 and 19. The three different indicators are GHG, CO2 and C. The majority of the companies consistently use all three indicators where GHG and CO2 are the most popular.

With regard to the inconsistent use of indicators, please refer to Appendix L and Table 10 where it can be seen that some of the selected companies have never used the indicator C in their NFRs. These companies are Kinnevik, Axfood AB, JM, Securitas and Swedish Match. On the other hand it can be seen in Diagram 2 and Table 10 that the number of companies using indicator C has increased from 10 to 17 during the ten years studied. This increase is particularly evident around the middle of the decade, which coincides with the introduction of UNSDG and the Paris Agreement. More companies are using the indicator C at the end of the decade than at the beginning, while there has been little change to the use of the two other indicators.

Results, however, have shown (see section 5 above) that none of the 24 selected companies' NFRs can be directly compared between the different companies over the timeframe studied. This indicates that the use of all three different indicators by the majority of the companies has not contributed to direct comparability between companies. Furthermore, what has been shown in 5.2.1 above, where the consistent use of an indicator does not guarantee direct internal comparability of NFRs over time, also applies to direct comparability of NFRs between companies. At the indicator level of analysis it is difficult to see any connection between the consistent or inconsistent use of indicators and the comparability of the NFR's between companies. Other factors must therefore be considered to identify how comparability can be achieved

### 5.2.3 Comparing with previous research on the use of indicators in NFR preparation

This study has found that the 24 selected companies use three different indicators for measuring climate change. These indicators are GHG, CO2 and C. Things that cannot be

directly counted require something that is made up or exists – an indicator (Carroll 1999; Lamberton 2005). Climate change is not directly measurable so indicators are required in order to measure it (Schaltegger & Burritt 2010).

i. Lack of continuity

This study has shown that indicators can be used by a company one year and not used the next. Take for example the indicator C. Previous research has shown that indicators can vary from year to year (Fagerström, Hartwig & Lindberg 2016a; Fagerström & Hartwig 2016). In some companies a totally new indicator for an existing problem is developed from one year to another resulting in it not being possible to compare the reports for that issue (Zsóka & Vajkai 2018).

ii. Lack of standardization

In this study very few of the companies' NFR's are directly comparable over a decade. This may be linked to indicator use of the companies. Some researchers have found that the use of certain indicators limited the standardization and comparability of NFRs as the indicators are too general, too vague and tend to be selected, adapted or modified according to the needs of the company. Under these circumstances comparing information on actual performance is not possible (Diouf & Boiral 2017).

One of the practical problems connected to indicator use is the poor availability of standardized, open and comparable data (Klopp & Petretta 2017). Harmonization of the use of indicators is important in order to be able to directly compare companies NFRs (Klopp & Petretta 2017; Thomas, Tennant & Rolls 2020; WCRP 2020). The use of one indicator alone may contribute to NFRs being directly comparable.

On the other hand, this study has shown that four out of 24 selected companies where all have used a diversity of indicators, GHG, CO<sub>2</sub> and C in a similar manner over the decade provide NFRs that are directly comparable internally over the entire ten year period (see section 5 and Appendix L). The possibility to directly compare NFRs between companies during this time period has not occurred under similar circumstances. This indicates that the conditions for indicator use leading to direct comparability of NFRs within companies are not the same as conditions leading to direct comparability of NFRs between companies. It should be noted, that using a diversity of indicators does not automatically provide NFRs that are directly comparable within companies.

### 5.3 The use of units of measurement in providing directly comparable NFRs

As can be seen in Tables 11, 13 and 20 and Appendix M there are two units of measurement used by the companies, CO<sub>2</sub> and CO<sub>2</sub>e when preparing their NFR.

Tabell 20. The different units of measurement used by some companies in a decade (an excerpt from Appendix M).

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB CO2										
CO2e	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent
Assa Abloy CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
CO2e										

### 5.3.1 Comparison of units of measurement used within single companies over time

Out of the twenty four companies in this study there are four companies that have presented their NFRs in a way that allows comparison of the Climate affecting emissions within a company over the ten years. These companies are ABB, Ericsson, Stora Enso and Volvo. This implies the possibility of a direct comparison of NFR's over the ten years for these companies. There are indications that the fact that each company consistently uses the same unit of measurement over the time period contributes to direct internal comparability of the companies' NFRs. ABB, Ericsson and Stora Enso have used the unit of measurement CO2e, while Volvo used the CO2 unit of measurement.

Referring to Appendix M, Tables 11, 12, 13, 14 and 20 there is a clear preference by some companies to use one or other of the two units of measurement.

Please refer to Table 21 which shows that seven of the twenty four selected companies use the unit of measurement CO2e. These companies are ABB, Astra Zeneca, Oriflame Holding, Ericsson, H&M, Stora Enso and Skanska. NCC uses CO2e from 2011 onwards.

Table 21. Companies that use the same units of measurement, CO2e, over a decade.

CO2e	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB	CO2 equivalents	CO2 equivalents	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent
Astra Zeneca	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Oriflame Holding	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Ericsson	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
H&M	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Stora Enso	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Skanska	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e

Nine of the remaining 17 companies use the unit of measurement CO2. Refer to Table 22 to observe these companies which are Assa Abloy, Boliden, Electrolux, ICA Group, Husqvarna, Securitas, Sandvik, SSAB and Volvo. This implies a direct comparability of these companies NFRs over the decade. However, Volvo is the only company whose NFRs can be compared over the ten years.

Table 22. Companies that use the same units of measurement, CO2, over a decade.

CO2	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Assa Abloy	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Boliden	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Elektrolux	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
ICAGroup	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Husqvarna	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Securitas	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Sandvik	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
SSAB	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Volvo	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2

Although previously indicated, having the same unit of measurement alone does not provide NFRs that are internally directly comparable over the decade. Consequently, this must be decided by other factors.

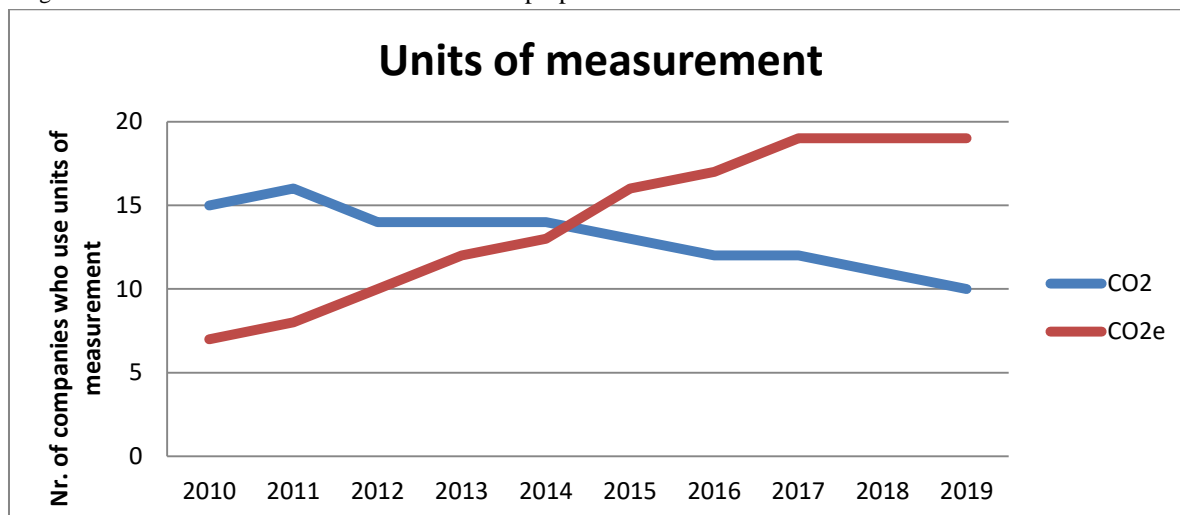
The remainder of the companies, seven of 24, have inconsistently used both units of measurements during the decade. This makes direct comparison impossible for the whole timeframe (see Table 23).

Table 23. A mix of units of measurement, CO2 and CO2e, within and between companies.

CO2e & CO2	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Alfa Laval	CO2	CO2	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Axfood	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2e	CO2e
JM	CO2	CO2	CO2	CO2	CO2	CO2e	CO2e	CO2e	CO2e	CO2e
Swedish Match	CO2	CO2	CO2	CO2	CO2	CO2	CO2e	CO2e	CO2e	CO2e
AAK	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2e
Fenix Outdoor Int.		CO2	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Kinnevik	CO2	CO2					CO2	CO2	CO2	CO2

Referring to Diagram 3 it should be noted that there is an increase in the use by the companies of the unit of measurement CO2e after 2015/2016. This increase coincides with the adoption of both the UNSDG and Paris Agreement in 2015 and 2016 respectively.

Diagram 3. The units of measurement used in the preparation of NFRs over a decade



### 5.3.2 A comparison of units of measurement used between different companies

Appendix M, Diagram 3 and Tables 11 and 13, clearly show an increase in use by the companies of the unit of measurement CO2e in the decade while the use of the CO2 has declined in this timeframe.

It can be seen from the Appendix M and Tables 11 and 13 that nine companies use the CO2 unit of measurement consistently over the ten years and seven of the firms use CO2e consistently over the ten years.

Diagram 3 clearly shows an increase in the use of CO2e by companies while the use of CO2 has declined in the decade. The increase in the use of CO2e has to do with changes due to regulations. The increase in the use of CO2e coincides with the introduction in 2011 of GHG Scope 3 emissions where CO2e is an important unit of measurement and the UNSDG and the Paris Agreement in 2015 and 2016 respectively. The decline in the use of CO2 could be attributed to the rise in popularity of CO2e during the decade.

It can be seen from Appendix M, Tables 21 and 22 that seven of the companies use CO2e as a unit of measurement and nine firms use the unit of measurement CO2 over the entire decade. However these companies cannot be directly compared between companies over this timeframe. Since having the same unit of measurement alone has not provided NFRs that are directly comparable over the decade this must be decided by other factors.

The inconsistent use of the units of measurement can be seen in the remaining eight companies which use a combination of the units of measurements CO2 and CO2e.

### 5.3.3 Comparing with previous research on the use of units of measurement in NFR preparation

#### i. Two units of measurement

This study has shown that two units of measurement are used by the selected companies' when preparing their NFRs over the decade, CO2 and CO2-equivalent (CO2e). Previous

research has shown that when measuring for climate change these same two units of measurement are recommended by researchers (Schaltegger & Burritt 2010).

## ii. Use of one unit of measurement

In this study, the NFR's that are shown to be directly comparable over a decade all use the same unit of measurement consistently over the ten years. This unit of measurement can either be CO<sub>2</sub>e or CO<sub>2</sub>. This is in line with researchers (Boiral & Henri 2015; Diouf & Boiral 2017; Ranganathan 2017; Staupoulou & Sardianou 2019; Thomas, Tennant & Rolls 2020) who have shown that the use of different units of measurement over time in the same company results in the lack of direct comparability of NFRs.

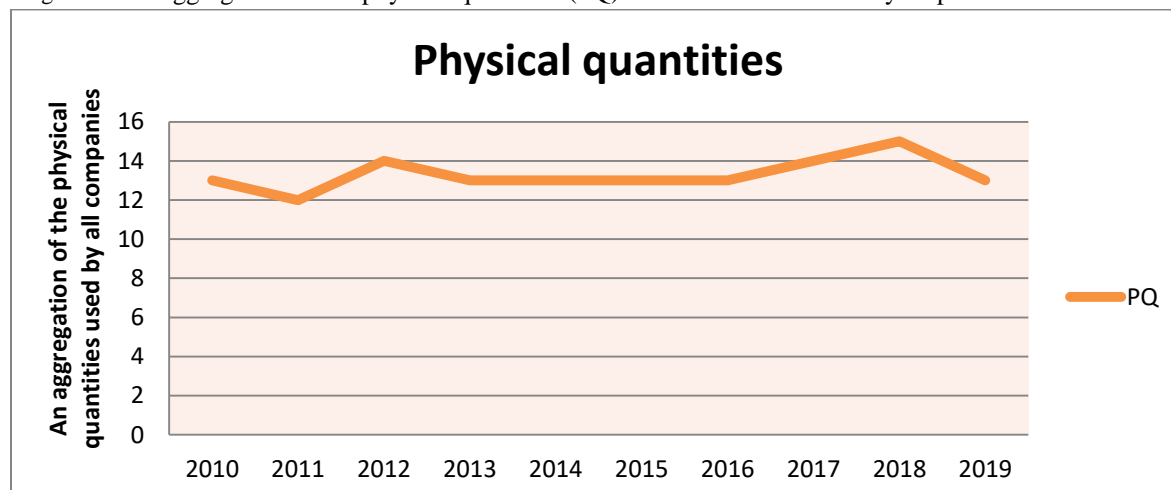
The selected companies in this study come from many different sectors thus for direct comparability purposes data should be presented in the same unit of measurement something that other researchers have highlighted (Staupoulou & Sardianou 2019).

There are indications in this study that even if companies use the same unit of measurement over the decade there is no guarantee that NFRs will be directly comparable internally. Please refer to Table 22 for an illustration of this where the company Assa Abloy has used the same unit of measurement, CO<sub>2</sub>, over the entire decade. However due to other factors the NFRs cannot be directly compared over the ten years.

## 5.4 The use of physical quantities in providing directly comparable NFRs

Companies use many different physical quantities when preparing their NFRs. By referring to Diagram 4, Table 15 and Appendix N it can be seen that the combined aggregated number of different physical quantities used by the 24 selected companies to report Climate affecting emissions in the NFRs over a decade is 13 in number. The use of so many physical quantities makes it difficult to be able to directly compare NFRs internally and between firms over the decade. Thirteen different physical quantities were used by the companies in 2010 and the same number was used in 2019, but not necessarily the same physical quantities.

Diagram 4. An aggregation of the physical quantities (PQ) used in NFRs over a 10 year period.



As can be seen in Table 15 above the different types of physical quantities used by the companies when measuring for climate change include kilotons, tonne, MT, metric tonnes, kt and ton.

#### 5.4.1 Comparison of physical quantities used within single companies over time

Please refer to Diagram 4 and Table 15 for information on the use of physical quantities in companies NFR's. There are indications that each company that consistently uses the same physical quantity over the time period contributes to direct internal comparability of the companies' NFRs. The four companies that could be directly compared internally over a decade consistently used the following physical quantities (in brackets): ABB (Kilotons), Ericsson (Ktonne), Stora Enso (Million tonnes) and Volvo (Kton). This indicates that there is a correlation between the consistent use of a physical quantity and direct comparability of NFRs.

However, the company JM has consistently used the physical quantity Ton over the entire decade. As can be seen in Table 11, 13 & 24, JM's NFRs could not be directly compared internally over the entire decade. Contrary to what has been previously indicated, having the same physical quantity alone has now been shown not to provide NFRs that are internally directly comparable over the decade. Consequently, the direct comparability must be determined by other factors.

Table 24. Physical quantities used by companies during the decade.

CO <sub>2</sub> e & CO <sub>2</sub>	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
JM	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton

The remaining 19 companies used physical quantities inconsistently during the decade.

Please refer to Tables 15 & 25 in order to see the inconsistent use of physical quantities by a single company. The many different physical quantities are an obstacle to direct comparability of NFRs. Two internationally recognised standards for weight and measurement could be one of the contributing factors to the use of different physical quantities used by the companies resulting in not being able to compare NFR's.

##### i. Standards of weight and measurement

There are in reality two internationally accepted standards of weights and measurements – the English system of yards/feet/inches and the metric system which includes meter/centimeter/millimeter.

In the metric system one tonne equals 1000 kilograms. However 1 ton is approximately equal to 0,907 tonne meaning that 1 tonne is approximately 93 kilograms heavier than 1 ton (Ton 2020). In measuring for climate change many of the companies have a very high discharge of emissions, so even if the difference in the two physical quantities appears to be small, the differences after conversions can be quite substantial.



Table 25. Examples of the most commonly used physical quantities by selected companies over a decade.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Assa Abloy	tonne	tonne	tonne	tonne	ton	ton	ton	ton	ton	ton
Boliden	Tonne	Tonne	Tonne	Tonne	Tonne	Tonne	Tonne	Mtonne	Mtonne	Million metric ton, Metric ton
Elektrolux	ton	ton	tonne	tonne	tonne	tonne	ton	tonne	metric kton	metric ton
ICA Group	Ton	Ton	Ton	tonns	tonne	tonne	tonne	tonne	tonne	tonne
Husqvarna	Metric ton, Ton	Metric ton, Ton	Metric tons, Tonne	Tonne	ktonne, Tonne	ktonne, Tonne	Metric tons, Ton, Tonne	Tonne	Tonne	Tonne
Securitas	Gram/km	Gram/km	Gram/km	Tonne	Tonne				Ton	Tonne
Sandvik	Metric ton	Metric tons, Ton	Metric ton, Ton	tton	Ton	Ton	Tton, Ton	tton, Ton	tton, Ton	tton, Kton
SSAB	Million ton, Ton	kton, Ton	kton, Ton	kton, Ton	CO2 Tonne	kton, Ton	Tonne	Kton	Kton	Ton, Thousand ton
Volvo	1000 ton	1000 ton	1000 ton	1000 ton	1000 ton	1000 ton	1000 ton	1000 ton	1000 ton	1000 ton, kton, Mton

#### 5.4.2 A comparison of physical quantities used between different companies

Please refer to Table 15 where it can be seen that there is very little consistent use of physical quantities between companies in this study.

On the contrary there is great inconsistency in the use of physical quantities used between the companies in the preparation of their NFR's. Please refer to Table 15 above and for example the years 2010 and 2019 in order to see the variety of physical quantities used by the different companies for these two years. These are kiloton, tonne, million ton, ktonne, MT, Mtonne, ton, t, Metric ton, Gram/km, t metric ton, kton, 1000 ton for 2010 and ton, metric ton, tonne, tton, kton and 1000ton, million ton for 2019. Generally, a combination of some of the 13 different physical quantities are used by the companies during one year when preparing their NFRs. Diagram 7 provides an aggregate of the physical quantities used by the 24 selected companies when preparing their NFRs.

As mentioned above there are two internationally accepted standards of weights and measurements. Companies in this study make use for example of the physical quantities ton and tonne. The physical quantity 1 ton is approximately equal to 0,907 tonne meaning that 1 tonne is approximately 93 kilograms heavier than 1 ton. Currently it is necessary to convert physical quantities in order to directly compare the NFRs.

In this study none of the selected companies NFRs could be directly compared between companies over the decade for climate change. However, four companies could be directly compared internally over a decade and it was shown that they consistently used the following physical quantities (in brackets): ABB (Kilotons), Ericsson (Ktonne), Stora Enso (Million tonnes) and Volvo (Kton). Direct comparison between these companies however was not possible due to the fact that none of the companies used the same physical quantities.

#### 5.4.3 Comparing with previous research on the use of physical quantities in NFR preparation

##### i. A mix of physical quantities

In this study it has been shown that companies use a mix of physical quantities when measuring for climate affecting emissions. Only four of the selected companies NFR's could be compared over a decade where the use of many physical quantities is one of the main reasons why so few NFR's are directly comparable over the ten years. Previous research has shown that when physical quantities are not the same this leads to difficulties in measuring non-financial performance (Diouf & Boiral 2017; Boiral & Henri 2015). Researchers have found that physical quantities can be used to directly compare non-financial reports provided that the data is harmonized (Dragomir 2011; Staupoulou & Sardanou 2019).

##### ii. Physical quantities mixed up

Companies not only use a mix of physical quantities when measuring for climate affecting emissions but also mix up two different physical quantities namely Ton and Tonne. When measuring these emissions, units of measurement are assigned a number which is expressed in a physical quantity such as Ton (Boslaugh & Watters 2008; Dragomir 2011). The problem with this is that 1 tonne equals 1000 kilograms and 1 ton is approximately equal to 0,907 tonne. This means that 1 tonne is approximately 93 kilograms heavier than 1 ton (Ton 2020).

This study has pointed out that poor comparability of different companies NFRs is connected to the lack of companies using the same physical quantities, which is in line with other researchers findings (Thomas, Tennant & Rolls 2000).

It is suggested in this study that direct comparability of NFRs internally over time is not decided by a consistent use of frameworks, indicators, units of measurement or physical quantities.

#### 5.5 Comparability of NFRs by combining Units of measurement & Physical quantities

The study has shown that four firms NFRs can be directly compared internally over the entire decade. The study has also shown that direct internal comparability of the remaining twenty companies' NFRs over the ten year period has not been possible for two main reasons connected to unit of measurement and physical quantities. One of the reasons is due to a change in the units of measurements (CO<sub>2</sub> & CO<sub>2</sub>e) used by the companies in their NFRs over the entire period. Please refer to Appendix M and Tables 11, 13 and 20 above where the different units of measurement used in the different companies NFRs are listed. The Table shows that the company JM, for example, has for the first five years used CO<sub>2</sub> as a unit of measurement and for the last five years from 2015 to 2019 used CO<sub>2</sub>e when measuring for climate change. By doing so it is not possible to compare JM's NFRs for climate change over a ten year period even though the company is using the same physical quantity.

The other reason is a change in the physical quantity that the companies used when measuring for climate change. Some of these companies have the same unit of measurement within the company over the ten years – this can be either CO<sub>2</sub> or CO<sub>2</sub>e. However the NFRs of these companies cannot be internally compared over the entire period due to a change in the physical quantity used during this time. To explain this in more detail Assa Abloy is taken as an example. Please refer to Table 25 above where it can be seen that this company used the same unit of measurement CO<sub>2</sub> over the entire ten years. However in the first four years of the decade the physical quantity used was tonne and from 2014 onwards the physical quantity used was changed to ton. As was pointed out in 5.4.1 above, 1 ton is approximately equal to 0,907 tonne, meaning that 1 tonne is roughly 93 kilograms heavier than 1 ton. Thus Assa Abloys Climate affecting emissions cannot be directly compared over the ten years without having first to convert the physical quantities so that they are the same for the entire ten year period. This situation is similar for many of the selected companies in this study.

In this report an Analysis model has been used comprising four components: frameworks, indicators, units of measurement and physical quantities. The model was developed for the analytical purposes of this study. The results of the study have been presented and discussed for each component as the analysis has developed. While none of the individual components have been shown to be a single decisive factor with regard to direct comparability of NFRs, it can now be concluded that direct comparability is determined by a combination of two of the components, namely units of measurement and physical quantities.

## 5.6 The influence of regulations on the direct comparability of NFRs

Three main regulations have been introduced during the decade and these may have contributed to an increase in the direct comparability of NFRs. These regulations are the:

- i. UNSDG which was adopted in September 2015.
- ii. Paris Agreement which was adopted in 2015 and came into force in 2016.
- iii. EU Directive (non-financial) which came into force in 2018.

### 5.6.1 The influence of regulations on frameworks & direct comparability of NFRs

With reference to Table 26 it can be seen that the number of companies using the framework UNSDG in 2019 has increased from 12 to 23 since the introduction of UNSDG regulation in 2015. It should be noted that the UNSDG regulation contained the UNSDG framework. In 2015 a total of 12 companies started to use the UNSDG. In 2016 an increase from 12 to 18 of the companies using UNSDG can be seen in Table 26 when the Paris Agreement was introduced. A further increase took place between 2018 and 2019 when the EU Directive was introduced.

Table 26. The use of the different frameworks by companies over ten years.

Framework	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
GRI	19	15	19	21	20	21	21	20	22	21
UNGC	24	24	24	24	24	24	24	24	24	24
UNSDG						12	18	19	20	23
CDP	17	15	15	17	18	19	18	19	18	18

Thus there are indications that the introduction of these three regulations has contributed to an increase in use of UNSDG by the 24 selected companies from the time the framework was introduced in 2015. The use by these companies of the other three frameworks has marginally changed in the time period from 2015 to 2019.

The introduction of the UNSDG regulation in 2015 and the following increase in the use of the new UNSDG framework can be seen as contributing to increasing the diversity of practices of the 24 selected companies. Thus there are indications that the introduction of the new regulations has not resulted in companies moving away from a diversity of practices and therefore not increased the direct comparability of NFRs.

### 5.6.2 The influence of regulations on indicators & direct comparability of NFRs

Please refer to Table 27 where the introduction of the regulations UNSDG in 2015, Paris Agreement in 2016 and the EU Directive 2014/95/EU in 2018 would appear to have had little immediate effect on the use of indicators by the companies.

Table 27. The use of the different indicators by companies over ten years.

Indicator	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
GHG	22	22	22	21	23	23	24	24	24	24
CO2	23	24	22	22	23	24	23	23	23	22
C	10	11	12	13	12	12	14	15	16	17

There are indications that the introduction of these three regulations has contributed to an increase in use of the indicator C by the 24 selected companies from the time they were introduced up until 2019. This increase in use of C can be seen as contributing to increasing the diversity of practices of the 24 selected companies. Thus there are indications that the introduction of the new regulations has not resulted in companies moving away from a diversity of practices and therefore not increased the direct comparability of NFRs.

### 5.6.3 The influence of regulations on units of measurement & direct comparability of NFRs

With reference to Table 28 there are indications that the introduction of the regulations UNSDG in 2015, The Paris Agreement in 2016 and the EU Directive 2014/95/EU in 2018 have not had any effect on the aggregated use of the units of measurement by the 24 selected companies in the time period 2015 to 2019.

Table 28. The use of the different units of measurement by companies over ten years.

Unit of measurement	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
CO2	15	16	14	14	14	13	12	12	11	10
CO2e	7	8	10	12	13	16	17	19	19	19

The number of companies using CO2 as a unit of measurement has decreased from 13 to 10 between 2015 and 2019. On the other hand, the corresponding figures for CO2e have increased from 16 companies to 19 during the same period of time. A change has therefore taken place with regard to which unit of measurement that the companies are using since the

introduction of the regulations. There is however indications that the introduction of these three regulations has not contributed to any change in the aggregated use of units of measurement between 2015 and 2019, where the increase in companies using CO<sub>2</sub>e corresponds to the decrease in companies using CO<sub>2</sub>. Thus it is suggested that the introduction of the new regulations has not resulted in companies moving away from a diversity of practices and therefore not increased the direct comparability of NFRs.

#### 5.6.4 The influence of regulations on physical quantities & direct comparability of NFRs

With reference to Table 29 there are indications that the introduction of the regulations UNSDG in 2015, The Paris Agreement in 2016 and the EU Directive 2014/95/EU in 2018 have not had any effect on the aggregated use of physical quantities by the 24 selected companies in the time period 2015 to 2019.

Table 29. The use of the different physical quantities by companies over ten years.

Physical quantities	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Nr. Of companies	13	12	14	13	13	13	13	14	15	13

Since no change has occurred, it can be suggested, that the introduction of the new regulations has not resulted in companies moving away from a diversity of practices and therefore not increased the direct comparability of NFRs.

#### 5.6.5 A summary of the influence of regulations on the direct comparability of NFRs

Connected to signalling pressures, there is a need for companies to provide non-financial information on their activities related to the social and environmental impacts of the firm. The provision of this information is obligatory under the EU Directive for large companies. All of the companies in this study are preparing NFR's throughout the entire ten years.

Institutionalizing pressures on companies are seen in the form of different regulations which the companies are expected to follow. Some of these regulations, the UNSDG, the Paris Agreement and EU Directive 2014/95/EU launched from 2015 onwards, have not increased the direct comparability of NFRs.

With regard to the four Analysis model components, which are frameworks, indicators, units of measurement and physical quantities, there are indications that the regulations have contributed to an increase in the use of frameworks and indicators, while there has been no change in the aggregated number of either units of measurement or physical quantities used by the 24 selected companies.

The increase in the use of frameworks and indicators, and the fact that there has not been a change in the aggregated use of the units of measurement and physical quantities, indicates that the companies have not moved away from a diversity of practice. The introduction of the regulations introduced from 2015 and onwards has thus not contributed to an increase in the direct comparability of NFRs.

There is a need for coercive and instructive regulations in order to come to terms with the companies' diversity of practices, which are currently preventing the direct comparability of NFRs.

## 6 Conclusions

The purpose of this study is to compare over a ten year period, the NFRs of Large Cap companies on the Swedish Stock Market, from a “Climate Action” and emissions perspective, to determine if

- the direct comparability of NFRs has increased within companies
- the direct comparability of NFRs between companies has increased
- regulations launched during the past decade have increased the direct comparability of NFRs

This study has shown that it is difficult to directly compare NFRs and this is affirmed in previous research studies. The overall results of this report show a lack of direct comparability of the majority of the firms where only four of the 24 selected companies’ NFRs can be directly compared internally over ten years. The four companies are ABB, Ericsson, Stora Enso and Volvo.

This study has shown that in order to compare NFRs, a consistent use of a unit of measurement alone and a consistent use of a physical quantity alone does not provide for NFRs that are directly comparable. It is the combination of a unit of measurement and a physical quantity that is the decisive factor when it comes to making it possible to directly compare NFRs over time and between companies.

### 6.1 Direct comparability within a company

This study has concluded that direct internal comparability has not increased within companies over the time period studied. As in 2010, the companies are still showing a diversity of practices at the end of the decade, when it comes to the use of frameworks, indicators, units of measurement and physical quantities in their preparation of NFRs. Since the companies have not moved away from their diversity of practices, increased direct comparability of NFRs has not taken place.

Furthermore this study has concluded that internal direct comparability over time requires that a single company makes consistent use of a certain combination of units of measurement and physical quantities in their NFRs. Since the regulations are not sufficiently coercive and instructive this allows for individual interpretation of its contents. The single company can thus exert great freedom in the way it measures and reports climate change. It should not be a difficult task to assure internal comparability of their NFRs over time. The single company simply has to be consistent in the use of a specific combination of units of measurement and physical quantities.

### 6.2 Direct comparability between companies

It is concluded in this study, that direct comparability between companies’ NFRs has not increased over the time period studied. The observations regarding direct comparability between companies are essentially the same as for direct internal comparability. As in 2010

the companies are still showing a diversity of practices at the end of the decade, when it comes to the use of frameworks, indicators, units of measurement and physical quantities in their preparation of NFRs. Since the companies have not moved away from their diversity of practices, increased direct comparability of NFRs has not taken place.

Furthermore this study has concluded that direct comparability between companies requires that different companies make consistent use of the same combination of units of measurement and physical quantities in their NFRs.

As has been mentioned above, every single company exerts great freedom in the way they measure and report climate change. In order to achieve direct comparability of NFRs between companies, this degree of freedom should not be allowed. This study suggests that coercive and instructive regulations must be put in place. This is in order to assure a uniformity of procedures of all companies' diversity of practices when it comes to the use of units of measurement and physical quantities, and thus achieving direct comparability.

### 6.3 The influence of regulations on the direct comparability of NFRs

It is concluded in this study that the regulations introduced during the decade have not resulted in an increase in the direct comparability of NFRs internally and between companies.

The study shows that after the introduction of the United Nations Sustainable Development Goals and the Paris Agreement there has been a shift in the use of frameworks, indicators and units of measurement. The shift refers to the fact that a new framework, UNSDG, was introduced, the indicator C was used more frequently by the companies and units of measurement saw a rise in the use of CO<sub>2</sub>e while the use of CO<sub>2</sub> declined. No change occurred with regard to the large number of physical quantities used in the NFRs.

A similar impact has not been shown connected to the introduction of the European Union Directive 2014/95/EU. It is worth noting that the above mentioned shifts alone do not contribute to NFRs that are directly comparable.

From a theoretical perspective, with specific reference to signaling theory, the study shows that all of the selected companies are preparing NFRs throughout the entire ten years and thus contribute to reducing information asymmetry. However this study has also shown that information presented in the non-financial report can give a false signal and be misleading where for example all the emissions that the company is directly or indirectly responsible for are not presented in the NFR.

With specific reference to institutionalizing theory the three kinds of institutionalizing pressures have to varying degrees an effect on the uptake of voluntary non-financial issues by corporations where it can be suggested that mimetic and normative pressure play a more important role than coercive pressure.



In summary, from a signal and institutional perspective, the regulations that have been introduced are toothless as the majority of them are not obligatory. Companies have not realized the benefits connected to the reporting of climate related activities in such a way that the results are comparable. This perspective can possibly be linked to the lack of a strategic approach to these issues within a company.

It has been shown in this study that a decisive factor for direct comparability of NFRs is the consistent use of a combination of units of measurement and physical quantities. Despite the introduction of regulations, an increase in direct comparability of NFRs has not taken place. The companies have not moved away from their diversity of practices. There has not been more uniformity of procedures of the companies' combined use of units of measurement and physical quantities in this sample.

## 7 Implications

The almost complete lack of direct comparability of NFRs within and between companies over the last decade has a number of implications linked to the state of the environment, companies themselves, investors and other stakeholders of the companies and regulations governing climate change issues. It is important to distinguish the difference between direct comparability and comparability. The former in this study means that information contained in the NFRs, can immediately be compared without having to convert the information first. To be able to directly compare the results contributes to making the task easier for an investor or other stakeholder, when analyzing the vast amount of data connected to measuring Climate action and emissions.

In order to come to terms with one of the greatest challenges facing our planet, e.g. climate change, appropriate measures must be taken. The course of action has to be carefully weighed up and based on scientific research and analysis of correctly measured and reported data. Companies' NFRs provide a lot of important information that is being used for analytical purposes and evaluation. If this information is not easy to obtain, understand and compare, it will be difficult to decide on what measures that are appropriate to take. It is therefore essential that the information in the NFRs is directly comparable. Furthermore, the lack of effective coercive regulations within this field makes it possible for companies to provide false or otherwise unreliable information in the NFR. The current situation, as has been shown in this study, has severe implications on the possibilities to improve the state of the environment.

The implication for companies is that it is business as usual for firms when writing their NFRs. These NFRs are written by the companies themselves so there may be a natural tendency to provide information that portrays the firm in a good light. An implication from this study is that managers of companies should use one unit of measurement and one physical quantity when measuring for "Climate Action" and emissions.

Without effective coercive regulations companies do not have to move away from a diversity of practices. For whatever reason, enterprises can continue to provide information that is not comparable and correct, communicating a false picture of the non-financial impacts of the company. On the other hand, companies wishing to declare their emissions in a proper way may find it hard to do so, because of the lack of generally accepted standards.

The implications for investors and other stakeholders is that an honest assessment of the company's damage to the environment is difficult to make when data is not directly comparable. Investors should demand consistent and comparable reporting of Climate affecting emissions. Unreliable or false data makes a fair assessment impossible. This in turn influences for example the future fair financing of companies. Dishonest companies can get finances to continue with operations that they otherwise would not have obtained finances for. On the other hand, those companies who are investing time and money to tackle their negative environmental impact may not get the credit and recognition for their efforts and the resulting financial resources needed to stay in business. NFRs are of increasing importance where investors and other stakeholders want to know what measures companies are taking to address the environmental impacts of their enterprise.

The implications for regulating authorities are that they need to make regulations stricter, instructive and more coercive. This study has indicated that the current regulations have little or no impact on providing NFRs that are directly comparable. It has been shown in this study that a decisive factor for direct comparability of NFRs is the consistent use of a combination of units of measurement and physical quantities. The regulations should therefore be aimed at stipulating the consistent use of such a combination by all companies in the NFRs.

## 8 Discussion of trustworthiness, limitations, generalization and suggestions for future research

The non-financial reports prepared by each company may not be reviewed by an independent body. The quality of the data in the NFRs is thus subject to each company's discretion and a correct analysis of the data cannot be guaranteed.

The Analysis model used in this report is new, and the use of a different model might have produced different results. The new model, however, has been developed for analytical purposes in accordance with the delimitations of this very study and it can therefore be argued that its design is relevant for this purpose. Consequently, it can be argued that the findings derived from the use of the Analysis model are trustworthy.

Twenty four different companies have been selected for this study as discussed in section 3.2 above. If other companies had been chosen, this may have given a different result. All twenty four companies are Swedish, but there is an assumption that the preparation of NFRs will be similar throughout the EU due to the same institutional pressures.

The Large Cap companies studied in this report are Swedish and therefore within the EU. The study was carried out on twenty four selected enterprises. It may not be possible to apply the same logic to other large companies globally and get the same results. With regard to small and medium-sized companies the results may not be the same when using the same methods.

The focus in this study is on the environmental perspective of the non-financial report, specifically “Climate Action” and emissions. If other issues were focused on, this would possibly require other reporting methods using different indicators, units of measurement and physical quantities that are specific for those issues.

The analysis was carried out without specially designed computer software. Use of data programs may have provided a different interpretation of the results. The decade in question is an important and interesting period from a climate change perspective, given the significant and unprecedented changes in the related regulations that occurred during this time. Since only one UNSDG (UNSDG 13) has been addressed in this study, the results may have been different if other UNSDGs were chosen.

- 1) Future research could focus on non-Swedish companies and investigate the comparability of corporate non-financial reports within and between these enterprises over time, using the Analysis model developed in this study.
- 2) The results of this report may not apply to all of the original 97 companies, from which the twenty four companies in the study were selected. Future research could focus on the remaining companies and investigate the comparability of corporate non-financial reports using the Analysis model
- 3) Future research could focus on SMEs and investigate the comparability of corporate non-financial reports using the Analysis model and SMEs.
- 4) The Analysis model developed in this study is built up from principles giving it a stable foundation. The components of the Analysis model (frameworks, indicators, unit of measurement and physical quantity) have been used in this study showing that the two latter components – when there is uniformity of procedures – can be used consistently to provide NFRs that are directly comparable. Future research could use this Analysis model to investigate the comparability of corporate non-financial reports within and between companies over time for the other 16 UNSDGs which have not been addressed in this study.
- 5) A qualitative study based on for example interviews could be carried out to determine the reasons as to why companies prepare NFRs differently, resulting in a lack of comparability within and between these companies NFRs over time.

- 6) The Council Directive 2014/95/EU on non-financial and diversity information, as well as the complementary Council Directive 2017/C215/01, need to be reviewed and revised. An important condition for the effective use of EU Directives is that there is only one unit of measurement and one physical quantity used consistently by the companies in the preparation of directly comparable NFRs. A future study could look at these Directives and determine how they can be changed from their present form, so that they will contribute to uniformity of procedures in the field of preparing NFRs, thus making them directly comparable for all UNSDGs.
- 7) The companies of this study are part of a supply chain. As a supply chain is built on partnership it is of vital importance that the roles and responsibilities of the different actors regarding climate change issues are identified and determined. Given the many links in the supply chain there is a need to agree beforehand on where responsibility is placed, so that all actors are made aware of the risks associated with climate change and its related activities in the supply chain. This provides a basis for allocating related costs.

There is a need for future research regarding the origin of the emissions in the supply chain, who is responsible and who takes the risk for these emissions.

The reason for this proposed study is the need to determine who will pay the costs for the impacts of the emissions to the environment – will the risks be spread over the entire supply chain or only certain sections of it?

- 8) There are indications that normative pressure is influencing companies' behavior when preparing NFRs. Research could be carried out to identify in what way the normative influence, e.g. academia, could contribute to promoting standardized and directly comparable NFRs.
- 9) When the preparation of directly comparable NFRs has been achieved, future research could lay down the foundations for a combined financial and non-financial report, a sustainability report. Part of the research would focus on how the reporting can be balanced between financial and non-financial perspectives and address such issues as risks and responsibility.

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## Appendices

### Appendix A - EU 2017/C 215/01 2017

When drawing up a non-financial statement, the principles as set out in the guidelines for reporting of non-financial information are that the information is 1) material information 2) Fair, Balanced and understandable 3) Comprehensive but concise 4) Strategic and forward-looking 5) Stakeholder oriented 6) Consistent and coherent (EU 2017). There is one feature the framework that is considered important in the preparing of an NFR and is highlighted in the Directive. Non-financial reporting addresses two main issues the social and environmental dimensions.

### Appendix B – GRI

The aim of GRI is to be global, social, economic and environmental in scope, flexible (with descriptive and quantitative indicators) and with a stakeholder base. The GRI was modeled on the US financial reporting system (FASBI) which gave it legitimacy. Reputation management and brand protection are two good reasons for GRI reporting. Mostly large multinational companies use GRI while SME are barely represented (ibid.). In 2016, GRI launched its first global standards for sustainable reporting where all organizations can report publicly on their economic, environmental and social impacts to show how they contribute towards sustainable development (GRI 2020b). GRI provides a means to trace organizations social and environmental impacts by providing information on issues which may lead to company improvement.

### Appendix C – UNGC

The UNGC principles are as follows: Human rights 1) Businesses should support and respect the protection of internationally proclaimed human rights. 2) Make sure that they are not complicit in human rights abuses. Labour 3) Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining. 4) The elimination of all forms of forced and compulsory labour. 5) The effective abolition of child labor. 6) The elimination of discrimination in respect of employment and occupation. Environment 7) Businesses should support a precautionary approach to environmental challenges. 8) Undertake initiatives to promote greater environmental responsibility. 9) Encourage the development and diffusion of environmentally friendly technologies. Anti-corruption 10) Businesses should work against corruption in all its forms, including extortion and bribery (UNGC 2020).

In 2018 the UNGC issued a number of Global Compact Action Platforms. These are issues such as Pathways to low carbon & resilient development, health is everyone's business, business for humanitarian action and peace, decent work in global supply chains, water security through stewardship and anti-corruption and good governance. To achieve these issues there are a number of underlying Sustainable Development Goals (SDGs). For example Pathways to low carbon & resilient development can be achieved by addressing seven SDGs number 7, 8, 9, 10, 11, 12, 13.

The UNGC is basically a business partnership between organizations and businesses. It is not a regulatory instrument but a forum for commitment and discussion. The Global Compact does not recognize or certify the companies that fulfill the Compacts principles (UNGC 2020).

#### Appendix D – UNSDG

The UN is an international organization founded in 1945 and made up of 193 member states. The main organs of the UN are the General Assembly, the Security Council, the Economic and Social Council, the Trusteeship Council, the International Court of Justice and the UN Secretariat (UN 2020b). Key documents associated with the UN are the UN Charter, Universal Declaration of Human Rights and The Statute of the International Court of Justice.

The member states of the United Nations adopted the 2030 Agenda for sustainable Development in 2015 with 17 Sustainable Development Goals (SDG) at its core where these 17 goals list 232 indicators. The goals are used to chart a “universal, holistic set of objectives to help set the world on a path towards sustainable development” using all three dimensions of sustainable development, environmental, social and economic (Thomas, Tennant & Rolls 2000). The UN carries out a yearly in-depth analysis of selected indicators for each goal highlighting challenges and identifying areas that need attention. The UNSDGs are: 1)No poverty 2)Zero hunger 3)Good health and well-being 4)Quality education 5)Gender equality 6)Clean water and sanitation 7)Affordable and clean energy 8)Decent work and economic growth 9)Industry, innovation and infrastructure 10)Reduce inequalities 11)Sustainable cities and communities 12)Responsible production and consumption 13)“Climate action” 14)Life below water 15)Life on Land 16)Peace, Justice and Strong institutions 17)Partnerships for the goals. UNSDG 13 “Climate Action” and emissions is focused on in this study (UN 2020a).

Companies use these different non-financial goals as a means to measure a company’s progress towards the non-financial dimension. There are a number of challenges connected to the implementation of the UNSDG that need to be addressed in order for the implementation of these goals to be successful. These challenges in question form are: 1) How can the right stakeholders be brought together at the right time in the right place? 2) How can difficult tradeoffs be made? And 3) competing interests – how are these addressed? (WEF 2020). If you take for example UNSDG Goal 13 Climate change, fossil fuel companies will have to close in order to prevent CO<sub>2</sub> discharge to the environment (ibid.). UNSDG number 13 “Climate Action” and emissions are focused on in this study.

#### Appendix E – CDP

CDP is an international non-profit charity organization. It is in charge of a global disclosure system for companies, regions, states and others in order to help them to measure and manage their climate issues and other environmental impacts.

#### Appendix F - Annual accounts act

Financial accounting can be divided into internal and external accounting. The internal accounting is used and needed by a company to provide the corporation with information for

control purposes and control of the company. The external accounting is the business' public accounting and is aimed at the company's stakeholders (Skatteverket 2015). Accounting reports are the basis for economic decisions for the company and the stakeholders. These financial reports are to provide a true and fair picture of the company's financial situation. They are governed by regulations that have a number of characteristic properties (Deegan, Craig & Unerman 2011). These four qualitative properties are comparability, relevance, reliability and comprehensibility. The financial reports should be able to be compared over time and between companies (comparability), where the information is decision-making information (relevant), on what the company has actually performed (reliability) and that the information is written in such a way that stakeholders can understand its contents (comprehensibility) (ibid).

The provisions for non-financial reporting in the Annual Accounts Act are to be found in Chapter 6§ 10 (SFS 2016:947 2016). The law states that companies that fulfill more than one of the following conditions are defined as large companies and must - as such is a coercive pressure on companies - provide an NFR: 1. The average number of employees in the company during each of the last two financial years has been more than 250. 2. The company's reported total assets for each of the last two financial years amounted to more than SEK 175 million. 3. The company's reported net sales for each of the last two financial years have amounted to more than SEK 350 million. According to the Annual Accounts Act 1995: 1554, all companies, regardless of the form of association, which are covered by the Annual Accounts Act, Annual report for Insurance companies, Annual report for credit institutions and securities companies and which meet the size criteria shall report on non-financial issues.

#### Appendix G – Selection of 24 companies

Company
1. Arion Bank SDB
2. Addtech B
3. Ahlstrom-Munksjö
4. AAK
1. Atrium Ljunberg B
2. Arjo
3. Atlas Copco A
4. ABB
1. Avanza BankHolding
2. Attendo
3. Autoliv SDB
4. Alfa Laval
1. Betsson B
2. Balder B
3. Beijer Ref B
4. Assa Abloy B
1. Bravida Holding

2.BillerudKorsnäs
3.Bonava A
4. Astra Zeneca
1. Elekta B
2.Castellum
3.Dometic Group
4. Axfood
1.Evolution Gaming Group
2.Epiroc A
3.Essity A
4. Boliden
1. Handelsbanken A
2.Faberge
3.Getinge B
4. Electrolux A
1. Hexpol B
2.Hemfosa Fastigheter
3.Hexagon B
4. Ericsson A
1. Industrivärden A
2.Holmen A
3.Hufvudstaden A
4. Fenix Outdoor International B
1. Investor A
2.Indutrade
3.Intrum
4. H&M B
1. Kungsleden
2.Kindred Group SDB
3.Klövern A
4. Husqvarna A
1. Loomis B
2.Latour B
3.Lifco B
4. ICA Gruppen
1. Lundin Petroleum
2.Lundberg B
3.Lundin Mining Corporation
4. JM
1. Munters Group AB
2.Millicom International
3.MTG A

4. Kinnevik A
1. Nibe Industrier B
2.Nent Group A
3.NetEnt B
4. NCC A
1. Nordea Bank
2.Nobia
3.Nolato B
4. Oriflame Holding
1. Peab B
2.Nyfosa AB
3.Pandox B
4. Sandvik
1. Sagax A
2.Ratos A
3.Resurs Holding
4. Securitas B
1. SKF A
2.SCA A
3.SEB A
4. Skanska B
1. Swedish Orphan Biovitrum
2.Sweco A
3.Swedbank A
4. SSAB A
1. Thule Group
2.Tele2A
3.Telia Company
4. Stora Enso A
1. Veoneer
2.Tieto
3.Trelleborg
4. Swedish Match
1. Wihlborgs Fastigheter
2.Vitrolife
3.Wallenstam B
4. Volvo A
1.ÅF Pöyry B



## Appendix H - Development of an Analysis model

Due to concerns with regard to accounting for non-financial reporting, Lamberton developed a model for just that purpose. In this study a modified version of Lamberton's model is developed and used for analysis. First Lamberton's model is presented and then the relevant components taken from Lamberton's model are incorporated into Analysis model.

The main objective of a non-financial accounting framework is to measure performance towards sustainability (Dragomir 2011). Lamberton's model is based on the current financial accounting model, and was developed to provide information related to the financial objectives of the firm (Lamberton 2005).

Many approaches to accounting for sustainability come from traditional (financial) accounting principles/ practices (Lamberton 2005). Financial accounting has established standards for reporting and a long and proven accounting tradition.

### a. Lamberton's model (Lamberton 2005)

There is much information and practical application within the financial accounting area that can be used in the non-financial accounting field. (Lamberton 2005) uses this information to present a non-financial accounting framework which contains five key issues which he considers are critical components of a non-financial accounting framework. These five issues are:

- Objective of the sustainability accounting framework

The objective of the framework is to measure a corporation's performance towards sustainability.

- Principles that underpin the application of the framework

The principles are Reporting entity, Definition of sustainability, Accounting period, Scope, Materiality, *Units of measurement*, Precautionary principle and Capital maintenance. The definition of sustainability refers to whether it is one (environment), two (environment and social) the so called non-financial dimension or three (environment, social and economic) dimensions of sustainability that is being addressed.

- Data capture tools, accounting records and measurement techniques

Sustainability accounting data is captured and recorded by data management tools such as *performance indicators* in order to measure the environmental and social dimensions of sustainability. These tools are equivalent to financial accountant's journals which are used to record financial data.

- Reports used to present information to stakeholders

The data collected within the sustainability accounting framework is reported in a qualitative and quantitative form

- Qualitative attributes of information reported using the framework.

Qualitative attributes some of which are transparency and comparability are used throughout the process. These attributes are taken from financial accounting and are used to give the reader information on how the reports were prepared.

b. Principles connected to model development

*The importance of Principles*

The development of the analytical model for this study is primarily based on the principles of Lamberton's model. The use of principles is considered by many researchers as an important starting point for any framework. Principles are considered necessary in order to avoid the risk that companies hop over what is considered a starting point. This is an important step which can help to reduce impacts on people associated with a company's business and value chains (UN 2016a).

Many organizations and regulations are founded on principles. The EU consider that principles are an important starting point when drawing up a non-financial statement as set out in the guidelines for reporting of non-financial information (EU 2017/C 215/01 2017). The United Nations founded in 1945, dedicates Chapter I of the Charter of the United Nations to "Purposes and Principles" where a number of overarching principles for the UN Organization are presented (UN 2016b) (Heslin & Ochoa 2008) Strategic corporate social responsibility follows seven common principles where a corporation's new role in society involves making strategic decisions towards sustainability. Reporting principles promote temporal comparisons and comparisons among different organizations and grant credibility to stakeholder dialogue (Moneva, Archel & Correa 2006).

The development and use of the Analysis model involved identifying from the principles in Lamberton's model the Analysis model components of a non-financial accounting model.

Principles also play an important role in some of the frameworks, GRI and UNGC highlighted in this report. Take for example GRI where three principles are the basis for the GRI framework which are transparency, inclusiveness and auditability. The first two are the starting point for the reporting process and auditability focuses on data quality. These three principles are accompanied by eight complementary principles divided into three categories: what information to report, quality and reliability and accessibility of reported information. Interpretation of what information to report is usually related to the company's interests (Moneva, Archel & Correa 2006). The other frameworks highlighted in this report are the UNGC which is based primarily on 10 principles. In contrast, the UNSD goals are not underpinned with principles.

Building on the knowledge that principles are important, this study uses the Principles section of Lamberton's model from which to develop a non-financial accounting model.

As mentioned above it is the principles which guide the capture and reporting of accounting information (Lamberton 2005). The principles underpinning the sustainability accounting framework (Lamberton's model) are *Reporting entity*, *Definition of Sustainability*, *Accounting period*, *Scope*, *Materiality and Units of measurement*, *Precautionary principle* and *Capital maintenance*. The principles are determined by the objective of the framework together with the chosen *definition of sustainability*. The primary *objective* of Lamberton's model is to measure organizational performance toward sustainability. The definition of sustainability in

this study is the non-financial dimensions specifically the environmental issues. Lambertons principles can be compared to financial principles such as going concern and historical costs.

c. Development of the Analysis model for non-financial accounting analysis

The principles in Lambertons model are determined by the objective of the framework together with the chosen *definition of sustainability*.

*Reporting entity*

The reporting entity refers to the organization that is being looked at such as a household, community, regional and national level (Lamberton 2005). In this study the reporting entity are corporations.

*Definition of sustainability*

The definition of sustainability is the non-financial (environmental and social) aspect of sustainability. In this study it is the environmental dimension and more specifically “Climate Action” and emissions that are addressed. Although the objective is not a principle it is included here due to its vital role in determining Lambertons principles. The objective of Lambertons model is to measure organizational performance toward sustainability.

*Accounting period*

It is important to determine the extent of the accounting period over which an organizations performance toward the goal of sustainability is measured. One example of this is the life cycle of an organizations products and services which allows for a longer term accounting period (Lamberton, 2005). In this study the accounting period is one year and over a ten year period.

*Scope*

The scope or boundaries of a sustainability accounting system need to be defined so as to make the exercise manageable. Is it first or second level environmental impacts that are being assessed? First level environmental impacts are direct impacts on the environment and second level environmental impacts are impacts caused by suppliers of inputs (Lamberton 2005). All scopes are included in this study.

*Materiality*

The concept of materiality addresses the prioritization of impacts as it is not possible to manage all impacts caused by the company. For example lesser threats might be excluded (Lamberton 2005). *Materiality* analysis is an important activity carried out by companies. The information that is material to a company is based on an analysis (materiality assessment) which shows what information is important for the company in order for it to understand its development, performance, position and impact and takes into account internal and external factors. As a result of the materiality analysis a company is provided with a list of priority areas that they need to focus on.

The materiality assessment requires that a company prioritizes the competing dimensions of sustainability (Lamberton 2005; EU 2017/C 215/01 2017). The impact of a company's activity is a relevant consideration when making non-financial disclosures where impacts can be positive or negative. According to the Council Directive 2017/C215/01, a number of factors may be taken into consideration when assessing the materiality of information one of which is the "interests and expectations of relevant stakeholders" where a company is expected to gain a "good understanding of their interests and concerns".

The precautionary principle is mentioned as impacts that may not be precisely measurable or where there is a low risk which may anyway need to be prioritized and reported such as high volume low risk (that they might happen) events (Lamberton 2005).

A *unit of measurement* is one of Lamberton's principles that are part of the developed model and are focused on in the next section along with their physical quantity. Units of measurement on their own do not capture the phenomenon which it is intended to capture (Bell, Bryman & Harley 2019).

*Indicators* capture and record non-financial accounting data (Lamberton, 2005) and indicators are measured in terms of units of measurement which is one of Lamberton's models principles. Thus indicators are part of the model developed here. Indicators are considered important by researchers and organizations (Lamberton 2005; Fagerström & Hartwig 2016; Fagerström, Hartwig & Lindberg 2016; Diouf & Boiral 2017; EU 2017/C 215/01 2017; Zsóka & Vajkai 2018; UN 2020c) for performance measurement and a comparison perspective.

Capital maintenance applies to the biosphere where a sustainable cost is calculated and if this exceeds the accounting profit of the company the degree of unsustainability is in monetary terms. Sustainable cost is the cost of restoring the earth to the state it was before the company's impact on the biosphere (Lamberton 2005).

#### d. Delimitations

Many of Lamberton's principles are eliminated from the Analysis model that was developed and applied in this study for the following reasons. All the entities in this study were corporations so the *reporting entity* was the same and were constant. The *scope* was the same for all corporations. All scopes are included in this study that is both direct and indirect impacts to the environment. Both the reporting entity and scope are constants. Constants are rarely of interest to researchers (Bell, Bryman & Harley 2019) and were not taken up further in the study. *Materiality* and the *Precautionary Principle* were not further addressed here as the issue focused in the study were predetermined namely "Climate Action" and emissions. The *Capital maintenance* principle was also omitted. This principle was omitted as the economic perspective was not addressed in a non-financial report.

#### e. Analysis model

The components of the Analysis model are frameworks, indicators, units of measurement and physical units (see Table A). Frameworks are included in the model due to its importance in

the EU Directive. This Analysis model was tested in the study with focus on the climate change issue. The *accounting period* was the same for all corporations which was over a ten year period.

Table A. The Analysis model developed in this study used for comparing non-financial reports over time using indicator, unit of measurement and physical quantity that are harmonized.

Analysis model components	
Frameworks	
Indicator	
Unit of measurement	
Physical quantity	

Researchers (Staupoulou & Sardianou 2019) who have studied indicators, units of measurement and physical quantities have found that this data can be used to compare non-financial reports provided that the data is harmonized. Data harmonization, where the data is expressed in the same measurement units and physical quantities, was essential in order for it to be used in comparing between and within companies and over time (Thomas, Tennant & Rolls 2000). The developed model was used by analyzing 24 different companies NFRs over ten years from a framework, indicator, unit of measurement and physical quantity perspective.

#### *Frameworks*

There are approximately 21 frameworks mentioned in the EU Directives. Four of these are addressed in the study GRI, UNGC, UNSDG and CDP.

#### *Indicators*

Non-financial issues are multidimensional, multilevel and multidisciplinary where some issues are not directly measureable (Carroll 1999). Eurostat, the statistical office of the EU has as its mission to provide high quality statistics and data on Europe (Eurostat 2020). An indicator according to Eurostat (EEA 2020) is designed “to provide an assessment of progress towards established objectives or to describe a situation or trend”. Indicators can be constructed for different purposes and are determined by the questions it seeks to answer (Eurostat 2020). Eurostat uses GHG and CO<sub>2</sub> as its main indicators for Air quality. Greenhouse gases (GHG) was established as an indicator by the United Nations Environment Program UNEP (UNEP). CO<sub>2</sub> was identified as an indicator for Climate Change by the United Nations (UN Indicators 2020). According to (Schaltegger & Burritt 2010) there are two ways of accounting for climate, GHG accounting and Carbon (C) accounting. GHG accounting includes all GHG mentioned above in the literature study whereas Carbon accounting includes only CO<sub>2</sub> (ibid). For this study GHG, C and CO<sub>2</sub> are the indicators used for climate change.

#### *Units of measurement*

With regard to non-financial reports it has been shown that different methods are used in measurement (Ranganathan 2017). According to (Boiral & Henri 2015) it was impossible to rigorously measure and compare companies due to factors such as data heterogeneity

connected to measurement units. Measurement forms such as monetary, mass or volume units are necessary for assessing performance (Lamberton 2005). However it is important to have similar measurement scales in order to make it easier to compare performance. For example when money was used as an economic indicator it could be presented in different units of measurement or currency and not the same currency (Dragomir 2011) and therefore was not directly comparable. Units of measurement that were used in measuring emissions for climate change in this study are CO<sub>2</sub> and CO<sub>2</sub>e.

The units of measurement in the Eurostat environmental catalogue are in CO<sub>2</sub> and CO<sub>2</sub>e (Eurostat 2020). To give an example of change in emissions with regard to climate change, Eurostat statistics showed that CO<sub>2</sub> increased from 405 parts per million (ppm) in 2017 to 408 ppm in 2018. GHG was 450 ppm CO<sub>2</sub>e in 2016 and increased to 454 ppm CO<sub>2</sub>e in 2017 (EEA 2020). Note that climate change was measured here with two different units of measurement and as such are not immediately comparable.

#### *Physical quantity*

It is important to apply a consistent set of rules to a measurement system (Boslaugh & Watters 2008). For example a unit of measurement, such as CO<sub>2</sub>e is assigned a number. This number is expressed in a physical quantity such as ton or tonnes (ibid.).

#### f. The use of the Analysis model in this study

Please refer to Table A where the Analysis model with its components can be seen. This model was used to investigate the direct comparability of non-financial reports of 24 selected companies over time and between companies. Four Analysis model components are used to address the research question “Has direct comparability of companies’ NFRs, from a “Climate Action” and emissions perspective, increased within and between companies over the last decade as new regulations have been introduced?”

The environmental dimension of non-financial reporting and more specifically UNSDG 13 “Climate Action” and emissions was focused on in order to investigate the direct comparability of these reports over time and between companies. “Climate Action” and emissions was searched for using these Analysis Model components in all the NFR over a ten year period.

#### Appendix I – An introduction to the twenty four companies

##### *AAK Ltd*

The company is a leader in value-added vegetable oils and fat used in industries such as Dairy, Plant-based foods, Special nutrition, Chocolate and confectionary and other. There are 3800 employees in more than 25 countries and 20 different production sites. By 2030 the company wants to reduce GHG emissions per processed unit raw material by 22% (base year 2012) (AAK Ltd. 2020).

##### *ABB Ltd*

ABB has four businesses: Electrification, Industrial Automation, Motion and Robotics & Discrete Automation. The company operates in more than 100 countries with about 144,000

employees. ABB's target for "Climate Action" is to reduce GHG emissions by 40 % by the end of 2020 using 2013 as a baseline. Some of their GHG emissions come from electricity consumption, district heat consumption and CO<sub>2</sub> from transport (ABB Ltd. 2020).

#### *Alfa Laval Ltd*

Alfa Laval has 40 production facilities around the world. They provide products and solutions in the areas of heat transfer, separation and fluid handling where there are three main business divisions: Energy, Food & Water and Marine. Its customers are petrochemical, pharmaceutical, biotech, edible oils, diesel engines and pump systems. The companies aim is to reduce carbon emissions by 15 % between 2015 and 2020. Carbon emissions from energy consumption come from purchased energy, electricity and company cars. Carbon emission reduction comes from changing electricity agreements from fossil to renewable (Alfa Laval Ltd. 2020).

#### *Assa Abloy Ltd*

ASSA Abloy group market niche is in access solutions. Products and services include locks, gates and entrance automation systems. Other expertise areas are in trusted identities which include cards, tags keys and biometric verification systems. The company is focused on reducing their GHG emissions by reducing energy consumption. (Assa Abloy Ltd. 2020).

#### *AstraZeneca Ltd*

This is a pharmaceutical company. Their GHG emissions come from electricity, heat, steam and cooling purchased for own use. Combustion of fuel and operation of facilities are other sources (AstraZeneca Ltd. 2020).

#### *Axfood Ltd*

Axfood operates in the food sector where price worthy, good and sustainable food is in focus. The company has 10000 employees and a turnover of 50 billion Swedish Crowns. Axfood puts pressure on external transport firms to ensure a more environmental friendly alternative. According to the company's own calculations they have reduced their CO<sub>2</sub> e emissions by approx 50 % from 2009 (base line year) (Axfood Ltd. 2020).

#### *Boliden Ltd*

Boliden is a mining company with a broad range of metals such as zinc, copper, nickel, gold and silver. The company is decreasing their CO<sub>2</sub> emissions by increasing electrification of their transport and being more energy efficient (Boliden Ltd. 2020).

#### *Electrolux Ltd*

Electrolux is in the Households Durable sector selling household appliances such as dishwashers, washing machines etc. One of their achievements in "Climate Action" is an improvement in CO<sub>2</sub> efficiency for land transport by more than 11 % (baseline year 2015). Activities carried out to decrease their CO<sub>2</sub> emissions are increase renewable energy and develop energy efficiency action plans (Electrolux Ltd. 2020).

#### *Ericsson Ltd*

Ericsson is a supplier of information and communication technology (ICT) to the service sector. Around 40% of the world's mobile traffic goes through Ericsson's network. Their business areas are Networks, Digital Services, Managed Services and Emerging business. The company has an ambition of reducing their GHG emissions by 35% (baseline 2016) where the current reduction is 24 % (Ericsson Ltd. 2020).

#### *Fenix Outdoor International Ltd*

This company develops and markets high-quality outdoor gear. They have an ambition of reducing their CO<sub>2</sub> emissions by 40 % by 2025 where purchasing renewable energy, promoting energy efficiency and offset emissions from some operations are a number of their activities (Fenix Outdoor International Ltd 2020).

#### *H&M Ltd*

H&M is in the fashion industry. Transport is a major problem and air freight CO<sub>2</sub> emissions are in focus for reduction. The company have a goal of being climate positive by 2040. In 2019 they have changed their calculation methodology for CO<sub>2</sub> emissions using now the Sustainable Apparel Coalition Higg Index (H&M Ltd. 2020).

#### *Husqvarna Ltd*

Husqvarna produce forest and garden products including robotic lawn mowers. They also produce light construction products for professionals as well as watering products, garden hand tools and smart garden systems. Their aim is to decouple growth from CO<sub>2</sub> emissions. The companies CO<sub>2</sub> footprint from transport such as road, sea and air is 1 %. Electricity use in manufacturing contributes to a CO<sub>2</sub> footprint of 2 %. As developers and producers of many energy demanding products the company is aware that the use of these products can lead to CO<sub>2</sub> emissions due to use of for example fossil fuels as an energy source. Therefore the company is looking at innovative solutions to this such as battery technology (Husqvarna Ltd. 2020).

#### *ICA Group Ltd*

ICA is a retail company with focus on food and health. The company has a target that its operations will be climate neutral by 2020. GHG emissions have been reduced by 67% (baseline year 2006)(ICA Group Ltd. 2020).

#### *JM Ltd*

JM is a developer of housing and residential areas in the Nordic region with a main focus on new housing in good locations and expansion of university cities in this region. The company has 2600 employees. The company has a goal to reduce their GHG emissions by 20% by 2020 (baseline year 2015). Much of the transport used is from 3PL where JM is exerting pressure on these companies to reduce their carbon emissions (JM Ltd. 2020).

#### *Kinnevik Ltd*

Kinnevik is an industry focused investment company. Some of their portfolio companies are Zalando, Tele2, Livongo and more recently purchased MatHem and VillageMD. One of their goals is to ensure that their companies measure CO<sub>2</sub>e emissions. Business travel according to their home page contributes to 95 % of their CO<sub>2</sub> emissions (Kinnevik Ltd 2020).

#### *NCC Ltd*

NCC is in the infrastructure branch with projects ranging from roads, railways, bridges and tunnels, water and sewage plants, pipelines and plants for industry and the energy sector. The companys target for 2020 is to reduce their CO<sub>2</sub> emissions by 50% (baseline year 2015)(NCC Ltd. 2020).

#### *Oriflame Holding Ltd*

Oriflame Holding is an beauty company which generates 1,3 billion euro in annual sales (2019). The company decreased its GHG emissions per sales by 37% (base year 2010) with an ambition to reduce to 50 % by 2020. The reduction of GHG so far is due to use of



renewable electricity, energy efficiency measures and decreased travelling (Oriflame Holding Ltd 2020).

#### *Sandvik Ltd*

The company has 40000 employees and sales in more than 160 countries. They have expertise in materials technology and industrial processes and are active in the following areas: tools and tool systems for industrial cutting, equipment and tools, service and technical solutions for mining and construction and advanced stainless steels and special alloys and products for industrial heating. Their target is to reduce CO2 emissions by 1, 3 % in 2019 and by 50 % 2030 (Sandvik Ltd. 2020).

#### *Securitas Ltd*

This company is in the intelligent services branch. They offer protective services such as on-site, mobile and remote guarding, electronic security, fire and safety, and corporate risk management. They operate in 56 countries and have 370000 employees. The company's emissions policy is focused on the energy and transport sector where their baseline year is 2016 (Securitas Ltd. 2020).

#### *Skanska Ltd*

This is a construction and project development company. Its portfolio includes constructing and renovating buildings and infrastructure. It develops offices buildings, logistics properties and new residential buildings. Skanska has as a goal to have net-zero carbon emissions in its own operations and its value chain by 2045 (Skanska Ltd. 2020).

#### *SSAB Ltd*

This company has 14500 employees and produces steel such as Advanced High-Strength Steels (AHSS) and plate and tube products. SSAB plan to offer fossil-free steel by 2026 and to eliminate CO2 emissions by 2045 (SSAB Ltd. 2020).

#### *Stora Enso Ltd*

Stora Enso produces packaging, biomaterials, wooden constructions and paper. Their customers range from producers, printing houses, merchants, converters, joiners and construction companies. Their target is to reduce their GHG by 31 % from operations per tonne of board, pulp and paper produced (baseline year 2010). The companies reduction in 2019 was 25 % (Stora Enso Ltd. 2020).

#### *Swedish Match Ltd*

Swedish match produce tobacco products such as snus, cigars and chewing tobacco and also matches and lighters. They have approximately 4500 employees in nine countries. The company's goal is to reduce GHG emissions by 75 % by 2050 (baseline year 2017) (Swedish Match Ltd. 2020).

#### *Volvo Ltd*

Volvo is in the business of constructing trucks, buses, engines and construction equipment where the majority of their customers are within the transport or infrastructure industries. One target of the company is to reduce CO2 emissions from goods transport per produced unit by 20% by 2020 (Baseline year 2013) (Volvo Ltd 2020).

## Appendix J – Different use of GHG Scope 1, 2 & 3 in the twenty four selected companies

GHG in 2019	Scope
ABB	1,2,3
Assa Abloy	1,2
Astra Zeneca	1,2,3
AAK	1,2
Boliden	1,2
Oriflame Holding	
Ericsson	1,2
Fenix Outdoor International	1,2,3
Alfa Laval	1,2,3
Axfood AB	1,2,3
Elektrolux	1,2,3
ICA Gruppen	1,2,3
H&M	1,2,3
Husqvarna	1,2
JM	1,2,3
Kinnevik	1,2,3
NCC	1,2,3
Securitas	1,2,3
Sandvik	1,2
SSAB	1,2,3
Stora Enso	1,2,3
Swedish Match	1,2,3
Skanska	1,2,3
Volvo	1,2,3

## Appendix K – All framework distribution over ten years

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Assa Abloy	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Astra Zeneca										
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
						CDP	CDP	CDP	CDP	CDP
AAK	GRI		GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
Boliden	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI

	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
						UNSDG	UNSDG		UNSDG	UNSDG
			CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Oriflame Holding				GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
						UNSDG	UNSDG		UNSDG	UNSDG
	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP		
Ericsson	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
								UNSDG		UNSDG
	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Fenix Outdoor Int.	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
				CDP	CDP	CDP	CDP	CDP		
Alfa Laval	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
						UNSDG	UNSDG		UNSDG	UNSDG
	CDP	CDP		CDP	CDP					
Axfood	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
						CDP	CDP	CDP	CDP	CDP
Electrolux	GRI	GRI	GRI	GRI		GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
ICA Group	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI		
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
							UNSDG	UNSDG	UNSDG	UNSDG
									CDP	CDP
H&M	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Husqvarna	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
								UNSDG		UNSDG
	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
JM			GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Kinnevik	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
								UNSDG	UNSDG	UNSDG
	CDP								CDP	CDP

NCC	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
							UNSDG	UNSDG	UNSDG	UNSDG
	CDP	CDP	CDP			CDP		CDP		
Securitas			GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
								UNSDG	UNSDG	UNSDG
	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	
Sandvik	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
						UNSDG	UNSDG	UNSDG	UNSDG	UNSDG
	CDP			CDP	CDP	CDP	CDP	CDP	CDP	CDP
SSAB	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
							UNSDG	UNSDG	UNSDG	UNSDG
	CDP	CDP	CDP	CDP	CDP					CDP
Stora Enso	GRI	GRI	GRI	GRI	GRI	GRI	GRI		GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
							UNSDG	UNSDG	UNSDG	UNSDG
	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Swedish Match	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI		
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
										UNSDG
	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Skanska									GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
							UNSDG	UNSDG	UNSDG	UNSDG
	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP	CDP
Volvo	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI	GRI
	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC	UNGC
							UNSDG	UNSDG	UNSDG	UNSDG
					CDP	CDP	CDP	CDP	CDP	CDP

#### A summary of Framework distribution over ten years

Framework	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
GRI	19	15	19	21	20	21	21	20	22	21
UNGC	24	24	24	24	24	24	24	24	24	24
UNSDG						12	18	19	20	23
CDP	17	15	15	17	18	19	18	19	18	18

#### Appendix L – All indicator distribution over ten years

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
	C	C	C	C	C	C	C	C	C	C
Assa Abloy	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2

	C	C	C	C	C	C	C	C	C	C
Astra Zeneca	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2			CO2	CO2				
	C	C	C	C	C	C	C	C	C	C
AAK	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	
			C	C						
Boliden	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
										C
Oriflame Holding	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
		C	C	C	C	C				
Ericsson	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
	C	C	C	C	C	C	C	C	C	C
Fenix Outdoor Ltd.	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
				C	C	C	C	C	C	C
Alfa Laval	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
								C	C	C
Axfood	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Elektrolux	GHG	GHG	GHG		GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
	C	C	C				C	C	C	C
ICA Group	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
									C	C
H&M	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
	C	C	C	C	C	C	C	C	C	C
Husqvarna	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
							C	C	C	C
JM	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Kinnevik							GHG	GHG	GHG	GHG
	CO2	CO2				CO2	CO2	CO2	CO2	CO2
NCC	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
		CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2

	C	C	C	C	C	C	C	C	C	C
Securitas					GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Sandvik	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
							C	C	C	C
SSAB	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
				C	C	C	C	C	C	C
Stora Enso	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
	C	C	C	C	C	C	C	C	C	C
Swedish Match	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Skanska	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
	C	C	C	C	C	C	C	C	C	C
Volvo	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG	GHG
	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
	C	C	C	C	C	C	C	C	C	C

#### A summary of Indicator distribution over ten years

Indicator	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
GHG	22	22	22	21	23	23	24	24	24	24
CO2	23	24	22	22	23	24	23	23	23	22
C	10	11	12	13	12	12	14	15	16	17

#### Appendix M – All units of measurement distribution over ten years

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ABB										
	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalent	CO2 equivalents	CO2 equivalents
Assa Abloy	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Astra Zeneca						CO2				
	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
AAK	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
										CO2e
Boliden	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
Oriflame Holding										
	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Ericsson										
	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Fenix		CO2	CO2	CO2	CO2					

Outdoor Ltd.										
			CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Alfa Laval	CO2	CO2								
			CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Axfood	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2		
					CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Elektrolux	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
						CO2e	CO2e	CO2e	CO2e	
ICA Group	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
						CO2e	CO2e	CO2e	CO2e	CO2e
H&M										
	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Husqvarna	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
				CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
JM	CO2	CO2	CO2	CO2	CO2					
						CO2e	CO2e	CO2e	CO2e	CO2e
Kinnevik	CO2	CO2					CO2	CO2	CO2	CO2
								CO2e	CO2e	CO2e
NCC										
		CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Securitas	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
				CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Sandvik	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
SSAB	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2
								CO2e	CO2e	CO2e
Stora Enso										
	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Swedish Match	CO2	CO2	CO2	CO2	CO2	CO2				
							CO2e	CO2e	CO2e	CO2e
Skanska										
	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e	CO2e
Volvo	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2	CO2

#### A summary of Unit of measurement distribution over ten years

Unit of measurement	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
CO2	15	16	14	14	14	13	12	12	11	10
CO2e	7	8	10	12	13	16	17	19	19	19

#### Appendix N – A summary of Physical quantity distribution over ten years

Physical quantity	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Nr. Of companies	13	12	14	13	13	13	13	14	15	13