Nordic Council of Ministers

Green eDocuments in the Nordics – Automatic Sustainability Reporting

A NORDIC CROSS BORDER PROGRAM FOCUSING ON AUTOMATIC SUSTAINABILITY REPORTING – TO STREAMLINE BUSINESSES' MANAGEMENT AND REPORTING OF CLIMATE DATA

Contents

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Executive summary

Businesses across Europe and the Nordics struggle to collect and share the necessary data to comply with sustainability directives such as the Corporate Sustainability Reporting Directive (CSRD). Addressing this is important and urgent, as large publicly listed companies, insurance companies, and credit institutions (Public Interest Entities) with over 500 employees and covered by Non-Financial Reporting Directive (NFRD), must comply by 2024-2025, and publicly listed Small & Medium-sized Enterprises (SMEs) will need to do so by 2026-2027. Achieving compliance requires a high degree of transparency across a company's span of activities, including their supply chain, which means that the companies' suppliers also need to align with the regulations and requirements.

Findings suggest that complying with CSRD is a significant challenge for businesses and their sustainability- and reporting professionals. Many businesses have previously not been required to report on and share climate data, and therefore lack experience with the relevant datasets. The key challenges in relation to reporting, sharing and collecting climate data include:

- **Highly manual processes,** including manual collection, sharing and management of climate data.
- **Non-standardized data and calculation methods –** data exists in silos throughout the supply chain, and in different formats. In addition, multiple approaches exist for calculating the required data.
- **Current data (multiple) formats and structures** make it difficult to integrate data across systems and difficult to automate processes of collecting, sharing and reporting on climate data.
- **Limited experience, knowledge and collection** of climate data in many SME's.

These challenges and in particular the lack of standardized systems and data formats for exchanging information between businesses (B2B) means that companies need to find their own solutions to this challenge, which is proving to create a significant administrative burden for SMEs.

This project investigates how the burden of calculating and exchanging climate data can be reduced through Nordic cross-border collaboration, leveraging existing infrastructures, eDocuments and automation. The main body of work for the project has been developed through three interactive workshops, with relevant representatives from the Nordic countries. The workshops were conducted in the fall of 2024, and the objectives were to identify datapoints, mockups and integration solutions for climate reporting within existing digital infrastructures.

Through the 3 collaborative and explorative workshops, 13 recommendations were outlined. These recommendations can be segmented in four interconnected areas. For some of these, the project team have further substantiated the recommendations by drawing on relevant research. The 4 interconnected areas are:

1. Leveraging Existing Infrastructures and Frameworks to ensure scalability, interoperability, standardization of climate datapoints, and promote adoption by businesses.
2. Utilizing eDocuments, Standards and Classification for consistent and efficient climate data exchange.
3. Securing Reliability and Process Management by using existing workflows and systems wherever possible. This further aims to reduce redundancies and risks associated with the implementation process.
4. Aligning Calculation Methods and Guidelines to improve uniformity and comparability.

Implementing these recommendations will standardize climate data, enable automation and increase efficiency in collecting, sharing, and reporting climate data across systems. This not only helps businesses comply with CSRD but also positively contributes to optimized decision-making and (potentially) cost reduction in such areas as green procurement, supply chain transparency, and climate emission calculation.

For the recommendations to be effectively implemented, cross-border Nordic collaboration must continue and ideally be strengthened. The primary goal should be to explore the opportunities for standardization and leveraging digitalization and automation in climate documentation and reporting. The collaboration should explore and test ways to operationalize the standardized and automated exchange of data and expand focus to include other Environmental, Social and Governance (ESG) topics. This approach will elevate alignment across a broader sustainability area and enable collaboration with a wider network of experts and communities. The collaboration should, ideally, be anchored in established domains responsible for digitalization and sustainability initiatives.

In conclusion, this project presents an opportunity for the Nordic countries to take informed action in mitigating climate challenges through effective, inclusive and open collaboration and data-sharing practices, without imposing unnecessary burdens on affected companies.

1. Introduction

1.1 Background

The background of this project arises from the new regulation CSRD[1] issued by the European Union. The directive is part of the European Green Deal[2]. The directive requires companies to comply with more stringent sustainability related disclosure and reporting requirements, than ever before. In this context, companies will face two significant challenges:

1. The need to comply with new disclosure requirements and datapoints for reporting.
2. The need for increased levels of ESG data exchange and management[3].

The type of mandatory and standardized data sharing between companies required by CSRD has not been common practice, and therefore it represents a new administrative and financial burden for the companies subject to the directive. In addition, the directive introduces numerous new disclosure requirements and datapoints, for which the companies lack both understanding and data. Moreover, as large companies subject to CSRD are required to report on their entire value chain, including suppliers, SMEs will face significant pressure to collect and provide this data, even if they are not directly subject to CSRD. This project is designed to address the challenges that come with the new directive and goals set out in the European Green Deal. The focus is, to map out the business' needs for sharing climate data efficiently and the associated practical business needs for data management. The project aims to provide specific recommendations to streamline and simplify sustainability reporting and support long-term business growth, by mitigating burdens imposed on companies through regulatory requirements. The project will draw on the experiences gained through current and previous initiatives carried out by the Nordic countries. The Nordic countries have established a common framework through the Nordic Government and Business Program, with a focus on digitalizing reporting and data-sharing practices since 2016. This collaboration has resulted in the development of solutions that facilitate cross-border trade by enabling seamless exchange and integration of electronic documents (eDocuments). This work has resulted in the exchange of eDocuments and the information they contain becoming highly automated and efficient. The term

1. CSRD or Corporate Sustainability Reporting Directive mandates companies to report on their impact of corporate activities on the society and environment, and mandates assurance of the reported data in the integrated report. (European Parliament and Council, 2022)
2. The European Green deal is a set of political initiatives initiated by the EU commission. The goal is to reach climate neutrality in 2050. The key goals are Climate neutrality, Circular economy, Clean industries, Healthier environment, more sustainable farming and Climate justice and fairness. (Council, 2024)
3. ESG stands for "Environmental, Social and Governance", which are factors used to measure the environmental and societal impact of a company's activities and investments (Danish Business Authorities, ND). In that regard, it has not been common practice for companies now subject to these regulations to share their ESG data with one another, as mandated by CSRD.

"eDocuments" encompasses a broad range of digital documents that can be exchanged between a supplier and customer, such as electronic Invoices (eInvoices), and electronic Catalogues (eCatalogues). Today, these documents are primarily exchanged between public institutions and suppliers for public entities and are not widely used in B2B scenarios. Moreover, the current eDocuments do not contain much of the information companies need for their CSRD and ESG reporting, particularly for Scope 3 emissions[4].

As a result, these challenges create a strong demand in the market for standardized climate data and efficient data exchange. With respect to this, the project focuses on how eDocuments can facilitate the exchange of standardized climate data, not only to ensure compliance, but also to push for green data interoperability, leading to increased understanding of climate across supply chains and a better foundation for making lasting and positive changes. The argument is that large international companies without standardized data formats most likely will develop and impose heterogeneous compliance demands on SMEs, which would leave the SMEs with a significant and avoidable administrative burden, and shift resources from focusing on making a positive impact to purely ensuring compliance. The goal of integrating climate data in eDocuments and easing the administrative burdens of managing and exchanging climate data reflects parts of the Nordic Council of Ministers' goal:

"The Nordic Region shall be the most sustainable and integrated region in the world by 2030" (Aagaard, 2019).

1.2 Project Purpose

The purpose of this project is to provide recommendations to how the Nordic countries can reduce the administrative burdens connected with sharing climate data. The aim is to establish a common and interoperable frame for eDocuments in which companies can easily calculate and share their climate impact and thus promote sustainable procurement. The project further aims to integrate climate data into existing digital formats and setups. This includes specifications such as materials, weight, CO2 equivalents[5] (CO2e) emissions etc., of products or services, which is crucial information for the companies to collect in order to be compliant with CSRD and the European Sustainability Reporting Standard's (ESRS)[6]. The project will therefore build further on the existing Nordic countries' experiences to implement climate data in eDocuments.

4. Scope 3 emissions refer to activities that emits CO2e outside the company's control, but as a consequence of the company's activities. These emissions refer to the processes that happens in the early stages of the stages of a "products" life cycle, before it enters the reporting companies supply-chain, but also processes that occurs after the undertaking has sold a product (Barrow, Buckley, Clummis, & Draucker, 2013)
5. **CO2 equivalent** (CO2e) refers to a metric used for comparing emissions from different greenhouse gases. Other gases different from Carbon Dioxide (CO2) are converted with what is called "Global-warming potential (GWP)" factors, to CO2e emissions (Eurostat, ND).
6. The **ESRS Standards** are sustainability standards developed under the CSRD. They present a structured approach for companies to disclose their sustainability impact on earth and societies. In total, ESRS represents 12 standards, which takes into consideration all aspects of Environmental, Social and Governance (ESG). (EFRAG, ESRS workstreams, 2023)

1.3 Key Objectives

As stated, the project aims to investigate how, through a Nordic cross-border collaboration, administrative burdens can be eased, with particular focus on the exchange of climate data for businesses to calculate their climate footprint.

The project included three workshops in the fall of 2024, where the purpose was to develop mockups and identify solutions that can be integrated in the existing digital infrastructures and reach the specific requirements of climate impact calculations.

The summarized objectives in the workshops are:

- To concentrate on climate related datapoints which are mature and feasible for the current digital setups.
- To concentrate on how to integrate the climate related datapoints into the relevant eDocuments.
- To concentrate on how to enable automatic processing and reduce manual tasks.

1.4 Limitations of scope

Considering the extensive content covered by the CSRD/ESRS, there is a need to limit the areas explored in this project. This is done to ensure that the recommendations can be made as specific and actionable as possible.

1.4.1 Inside scope

The project focuses on incorporating the ESRS E1 standard, specifically the disclosure requirements E1-4 and E1-6 and associated datapoints, along with the Greenhouse Gas (GHG) protocol. This is to ensure that the data formats used in the mockups are both compliant with regulations and relevant to broader climate reporting needs. Further, the project will primarily focus on product data, more specifically on category 1, according to the GHG Protocol, "Purchased goods and Services".

1.4.2 Outside scope

The project will not investigate other sustainability reporting standards and will focus solely on the climate aspect of ESG. Whereas areas within the environmental aspect of ESG with undetermined methodologies, such as biodiversity, has not been considered during this project. Additionally, energy data and transport data has not been considered during the workshops or in the development of the mockups, due to e.g. the Mobility and Transport regulation "exchanges of regulatory Freight Transport Information" (eFTI) will facilitate the aspects of transport of freight (European Commision, ND). Additionally, only CO2e will be used as the emission factor to calculate the climate impact of a product or service. Lastly, national legislation and requirements for digital reporting have not been included.

2. Methodology

2.1 Approach

The methodology section of this report serves as a directional guide for the reader, to understand how information has been collected and generated throughout the project. This section guides the reader through how objectives have been examined during the project in Q3 and Q4 of 2024, providing transparency into the methods and processes used. The project has used both firsthand and secondhand data, leveraging qualitative methods for firsthand data and additional research and publications for secondhand data. The workshops were structured after a 3-step approach: 1) Align on challenges and current state, 2) Define the objectives for change in accordance with the project's overall ambition, and 3) Conduct exercises and discussions designed to develop recommendations and suggested next steps. To ensure consistency, the 3-step approach was supplemented with a focus on "why" (alignment on the criticality, value and challenges), "what" (alignment on scope and focus), "how" (alignment on feasible actions), and "next steps" (prioritization of action and creation of recommendations).

The identified next steps make up the recommendations of this report. In order to summarize and visualize how this project has addressed the identified challenges and reached the recommendations of this report, a gap overview (THE CHASM) has been created. Figure 1 illustrates the AS-IS Scenario, the Chasm (TO-DO) and TO-BE Scenario. The "why", "what", "how" and "next steps" were addressed before, during and after the workshops. The AS-IS Scenario or the "why" column reflects the current conditions that most ESG Managers are working under and the challenges they encounter, but also why these challenges have arisen, e.g. due to new regulations and demands from the market.

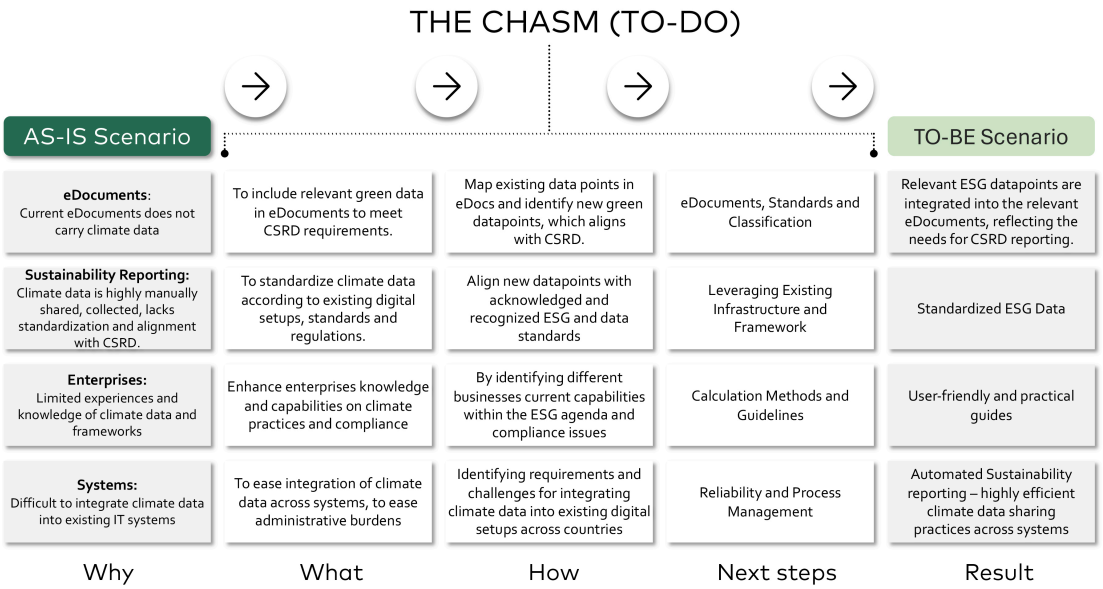

Figure 1: An extensive figure showcasing the "AS-IS" Scenario, the chasm (to-do), and the "TO-BE" scenario.

The "The Chasm (TO-DO)" illustrates the objectives, work and outcomes for this project. Additionally, the "what" column highlights the problem statements and objectives addressed in the workshops. These were explored through specific activities and exercises to tackle the identified challenges of the "AS-IS" scenario. The "How" column highlights the approach and outcomes of the activities from the "what"-column during the workshops. The "next steps" column are the recommendations for how to proceed, to leverage the knowledge and experiences gained during the project and move towards the "TO-BE" scenario, which represents the desired future state of "Climate reporting". The next steps in figure 1 represents 4 categories, in which 13 recommendations have been grouped into – all 13 recommendations can be assessed in section 9.

The "TO-BE" state is characterized by low administrative burdens of sharing climate data among stakeholders in the private sector (B2B) and public sector (B2G). The individual "AS-IS"[7], and "TO-BE"[8] scenarios are elaborated on in the sections "AS-IS" and "TO-BE". The specific approaches, outcomes, takeaways, and work from the workshops are outlined throughout the report.

2.2 Firsthand data

This section will shortly explain how first-hand data was collected and processed during the project period.

2.2.1 Workshops:

Three workshops were held, during which, a focus group was established, consisting of experts from Norway, Sweden, Iceland, Finland, and Denmark (see Appendix 2). The intention of the focus group was to draw on the participants' relevant experiences within their field, to gain the right perspective on the challenges and objectives stated in the introduction section of this report and figure 1, and to leverage this same expertise to devise feasible and actionable recommendations for improvements. The participants' areas of expertise lie within the areas of; data-standards, classification, specifications, formats, structures, automation, legislation and sustainability (see Appendix 2). All experts who participated in the workshops, are also "eDocument experts". As stated above, each workshop was structured around the principles of "The Why," "The What," "The How," and focused on working towards the "Next Steps" and the "TO-BE" scenario.

7. AS-IS represents the current state of how processes operate before changes has been made.
8. TO-BE represents the desired state of the processes - when changes have been made to the AS-IS process.

2.2.2 Summary of Workshop 1 (WS1) – Identifying relevant Green Datapoints:

Objective (what):
The objective of this workshop was for experts to identify and define the key (ESRS) datapoints essential for calculating the climate footprint of purchased products. Furthermore, the focus was also on automation, with the goal of creating a more efficient process that minimizes manual effort, improves accuracy, and ensures scalability in tracking climate impacts.

Knowledge enhancement (why):
Regarding the objective, the expert groups were introduced to CSRD and its associated ESRS E1 standard and current practices, to expand their understanding. Additionally, they were introduced to current initiatives and solutions in Denmark, Norway, Sweden, and Finland from the perspective of public institutions, focusing on how they are addressing sustainability and climate calculations.

Exercise (how):
The experts were tasked with identifying, elaborating, and prioritizing individual datapoints, relevant to eDocuments and the demands from CSRD (see appendix 4). This will be elaborated further in the section "The Green Datapoints".

2.2.3 Summary of Workshop 2 (WS2) – Building Mockups & Integrations:

Objective (what):
The objective for this workshop was for the experts to continue the effort of easing cross-border administrative burdens for the exchange of climate data but focusing on creating mockups for standardized green product data in eDocuments and integrating these with existing digital systems, based on company practices and Nordic experiences.

Knowledge enhancement (why):
Regarding the objective, the experts were introduced to a real-world company "Better World" (BEWO) who is a startup company that has specialized in calculating scope 1, 2 & 3, mostly through AI to extract the relevant information from eInvoices, line by line. They were introduced to BEWO, to increase their understanding of how a private company is trying to solve the challenges that come with CSRD. Furthermore, a short presentation was made, which entailed a presentation of the datapoints that was scored as mature and feasible datapoints in WS1, and how the datapoints in between the workshops have been processed and analyzed.

Exercise (how):
The experts were presented with three mockup levels (high, medium, and low), showcasing the most relevant datapoints at each level. The three mockup levels aimed to foster collective alignment and provided the foundation for developing the final mockups. The three mockup levels featured the most relevant datapoints required to deliver on the objectives and mitigate the challenges. Hence, the group were tasked

with developing one mockup for each of the relevant eDocuments, with the most crucial and feasible datapoints. Finally, the next steps were evaluated in collaboration, in terms of potential initiatives, proof of concepts, success criteria, and what would be required to implement the mockups.

2.2.4 Summary of Workshop 3 (WS3) – Risk assessment and evaluation of prior results.

Objective (what):
The objective for this workshop was to ensure the final alignment on selected Datapoints and Mockups for climate data reporting in eDocuments, adapt the content and recommendations to fit national contexts, evaluate risks associated with the proposed recommendations, and outline actionable next steps for broader adoption.

Knowledge enhancement (why):
Regarding the objective of evaluating challenges and risks associated with the recommendations, the experts were introduced to a solution called CarbonKey, developed by KMD. In this context, KMD presented how they are working with GHG accounting, the current challenges they are facing, and the risks they foresee in the future regarding companies' compliance with the CSRD. Furthermore, KMD introduced how they are working with extracting line items from eInvoices, using sophisticated Artificial Intelligence (AI) and Machine Learning (ML)-models, to calculate the CO2e emissions associated with each product purchased.

Exercise (how):
Between workshop 2 and 3, the AS-IS – TO-BE visualizations were created to summarize previous discussions and support the dialogue. The experts were tasked with evaluating the AS-IS and TO-BE scenarios to ensure alignment among all stakeholders involved in this project. Furthermore, all recommendations based on the previous workshops were evaluated to reflect the needs, context, regulations, and other factors of each country, ensuring that the recommendations are representative of all countries involved. Lastly, the experts were divided into country-specific groups to reflect on the challenges and risks associated with the recommendations. They assessed the likelihood of these risks occurring and evaluated the severity of their potential impact if not mitigated.

1.3 Additional research and publications used (secondary data)

The secondary data used in this report are mainly drawn from public institutional reports, and websites of known organizations and public institutions. By doing so, it allows the report to leverage the expertise and experiences in the fields of sustainability reporting, as well as the integration of the specific eDocuments such as eCatalogue and eInvoices across both the public and private sector in the Nordic countries. By using these sources, the report also aims to provide an extensive view of current developments and practices.

3. AS-IS:

This section and its visualizations are not intended to provide an exhaustive description of the challenges or the solutions to the burdens of climate reporting. Rather, it is a simplified and condensed version of how the working group has outlined the real-life climate data reporting work- and process data flows before and after the deployment of the recommendations outlined in this report. The figure is designed to be generic and applicable at a cross- Nordic and industry level, and therefore it does not consider the variances in complexity and requirements for various company sizes and industries. For this reason, the illustration can serve as a communication tool that can enable alignment and add value to existing initiatives. One example is the Danish Automatic Business Reporting initiative which aims to increase the digitization and automation of all business reporting (incl. ESG) in Denmark. The overview can be leveraged to secure a shared understanding of the short-term challenges and needs for climate reporting, as well a basis for an integrated and actionable plan of action. Alternatively, the overview can be modified to include additional details relevant to a specific industry and/or company, thus enabling the mapping of specific challenges, actors, and solutions.

3.1 Burdens and Context (challenges):

The following section shortly outlines the economical burdens associated with complying with CSRD. It outlines the (cross-industry) current state for companies regarding how companies handle ESG data.

The Danish Business Authority has conducted an "Activity-based measurement of companies" administrative burdens" (AMVAB) analysis of the implementation of CSRD and the administrative burdens posed on the companies as a result of the requirements associated with sustainability reporting. *NB: This analysis only considers Danish companies subject to CSRD*. It is assumed that similar costs will occur in the other Nordic countries. The analysis shows that CSRD and the non-sector-specific ESRS standards will impose a **total transition cost at approximately 6 billion DKK** on Danish companies. Figure 2 illustrates which companies will be subject to CSRD now and in the future, and a breakdown of the "administrative costs" in the transition / implementation phase of CSRD (COWI & Danish Business Authorities, 2024).

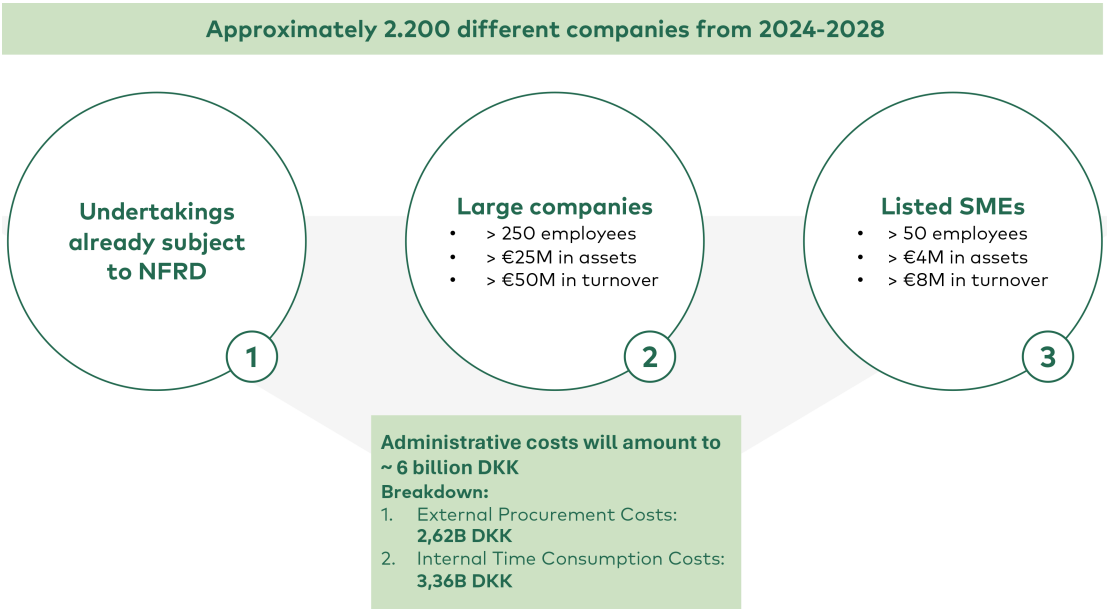

Figure 2: Illustrates the administrative burdens imposed on companies subject to CSRD in the transition phase – a lump sum, for Danish companies (COWI & Danish Business Authorities, 2024).

The AMVAB analysis further shows the **annual cost of complying with CSRD** to be at approximately **5.1 billion DKK,** based on how ESG data is currently handled. This includes activities, such as collecting ESG data, data management and complying with the directives' requirements (COWI & Danish Business Authorities, 2024). In relation to this, it has been examined how companies are managing their ESG data, today. Approximately 90% of companies are planning to use or are currently using spreadsheets for sustainability reporting (Lange, Picard, & O'Connel, 2024). The reason for using spreadsheets at present is their attractive functionality, as they are flexible, cheap and easy to use, when it comes to manipulating and organizing data.

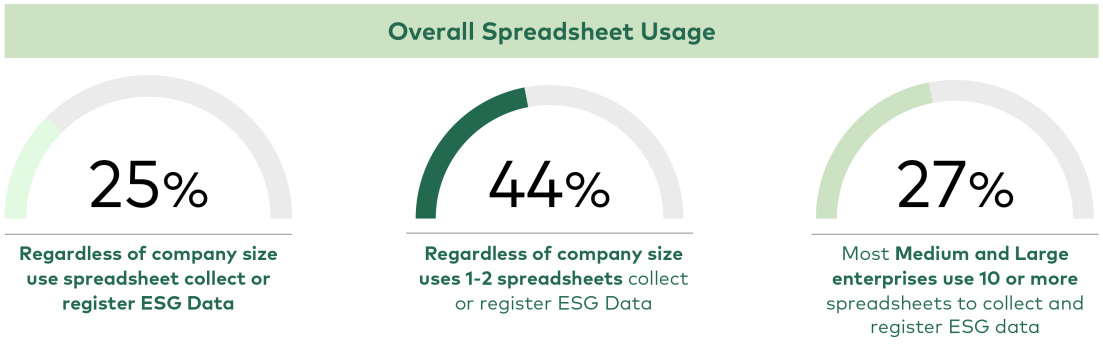

Figure 3: Illustrates the current use of spreadsheet tools among enterprises to collect and register ESG data (Danish Business Authorities & Deloitte, 2023).

Figure 3 indicates that 25% use spreadsheets regardless of company size to collect or register ESG data. While 44% of all enterprises use 1-2 spreadsheets and 27% of medium and large enterprises use 10 or more spreadsheet to collect and register their

ESG data. Whereas **74% of all small enterprises do not collect or register any ESG data** (Danish Business Authorities & Deloitte, 2023). Considering the use of spreadsheets, it indicates that the sharing, collecting, processing and reporting of ESG data are highly manual. Nevertheless, with the new directive in place, it will require a considerable amount of time to manage and cope with the new disclosure requirements, assuming the businesses will continue to use spreadsheets to deal with ESG data to a high extend. In addition to this, there are multiple reasons why businesses continue to use spreadsheets and manual practices. This is due to:

1. **Slow adoption** of necessary digital tools to cope with the ESG agenda. Some of the reasons for this are that available systems are relatively **immature, expensive to acquire, maintain and costly in terms of change management**.
2. **Businesses have, to a limited extent, not been dealing with this kind of data before.** Hence, many businesses have limited knowledge and experience on what it takes to comply with such directive.
3. The previous **"Non-Financial Reporting Directive**" only required large publicly listed enterprises to report on **a limited set of datapoints**, allowing companies to "easily" comply with the directive.

To further illustrate current practices for handling ESG, a process flow and a user-journey have been included below.

3.2 Overview of current processes

The following section illustrates a generic and conceptual example of the current role of an ESG manager, their workflows, processes and the associated challenges.

The AS-IS figure 4 illustrates the current state of how ESG Managers and companies interact with relevant stakeholders throughout the supply-chain, to collect and report on ESG (climate) Data. The illustration consists of 4 columns in total, which together make up a process flow where an ESG Manager collects, cleans, structures, calculates, analyses, optimizes and reports on ESG Data. The figure also illustrates the stakeholders involved in the data collection process and the recipients (users) of the ESG data. The flows go from left to right, starting in the column "Data In (Collection)" and moves towards "Destination / Users".

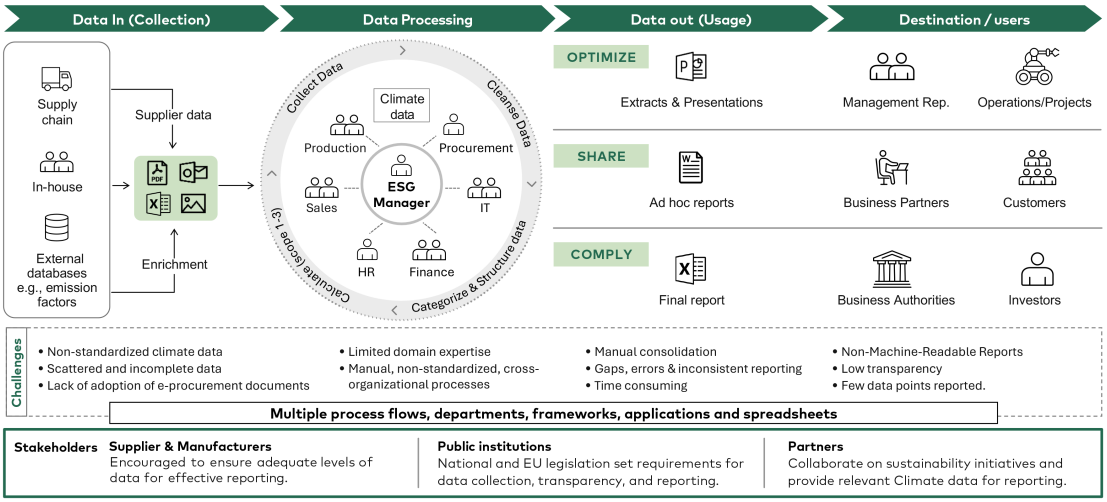

Figure 4: Illustration of the AS-IS Process for how an ESG manager tackles and navigates the world of ESG reporting today.

As illustrated in figure 4, the current collection, structuring, calculation and reporting processes of ESG data are, in most companies, mainly handled manually by either one ESG manager or a smaller ESG team. Moreover, from a collecting point of view the ESG data exists in silos, meaning data throughout the supply chain comes in different formats and structures. This non-standardized data is difficult to integrate and validate across IT-systems. As a result, the majority of ESG data is exchanged via emails (attachments). These attachments can be PDF-files, spreadsheets, pictures of invoices etc., which makes it difficult to share the data efficiently, as these often comes in a "non-machine-readable" format.

To exemplify the ESG inherent reporting challenges illustrated in the "AS-IS" overview, a generic "user-journey", has been outlined in figure 4. The user journey is a product of discussions within the working group and is based on a "fictional" wholesale company. The company is defined as a publicly listed medium-sized company, and therefore not subject to the previous "Non-Financial Reporting Directive" (NFRD), but will become subject to CSRD in 2027, and need to publish their first report in January 2028. However, the focus on sustainability and the pressure from business partners for greater transparency and insight into products have been priorities for many businesses in recent years. As a result, the company has some experience in collecting, processing, and sharing ESG data. Additionally, as stated in the introduction, larger companies subject to CSRD must meet their compliance obligations immediately. This, in turn, compels SMEs to align with the requirements imposed by the directive – the wholesale company falls into this category.

Through research and careful considerations, it has been established that the company must go through six overall steps during a financial year – these are indicated in the user-journey and are as follows:

Step 1: Identify the correct sources for data collection.

- **Step 2:** Request and collect relevant data from suppliers.
- **Step 3:** Organize and store data.
- **Step 4:** Verify and do quality controls.
- **Step 5:** Routine updates - to ensure data reflect any changes.
- **Step 6:** Consolidate data for integrated ESG reporting.
- **Step 7:** Submit the report for auditing and publication (optional in this case).

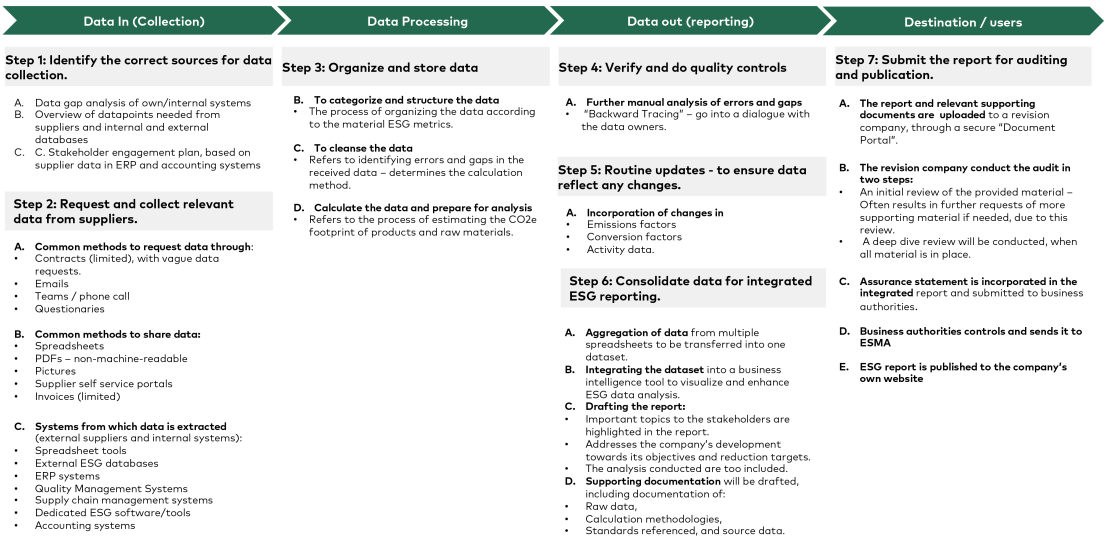

Figure 5 – Illustrates seven phases a company must go through during a fiscal year, when reporting on ESG – Based on real-world practices.

Each phase in the user-journey figure represents the high-level activities that are necessary for the ESG manager and the ESG team to go through, in order for the professionals to report on the ESG data.

These activities are disrupted or hindered by the aforementioned, unfortunate combination of manual processes, immature stand-alone tools (often emails and spreadsheets), and challenges with ESG data storing (multiple data formats and systems). While the manual workarounds employed by many companies may work in the short term, they will become increasingly inefficient, as the amount of mandatory (CSRD) datapoints increase. Therefore, businesses will need integrated and automated solutions to exchange ESG information more efficiently.

When it comes to data collection, large enterprises have started to mandate, through contractual agreements, their suppliers to provide required ESG data, e.g., through digital supplier platforms. This is a positive trend and done with good intentions, however, the specifications and requirements of which datapoints they should deliver and how, are vaguely described. One reason may be that since even large enterprises

are at the early stages of understanding CSRD, they are also just now trying to establish the ideal systems and processes to meet the disclosure requirements.

To better understand the motivation and challenges, it is important to consider the stakeholder perspective on the reporting activities themselves. The role of stakeholders will be elaborated in the section below, "Stakeholder Involvement".

3.3 Stakeholder Involvement

To better understand the stakeholders' level of maturity in sharing ESG data, it is crucial to identify the types of stakeholders involved in the supply chain. Figure 6 takes its starting point in the user-journey (see figure 5). The figure illustrates the stakeholders from which data is collected, cf. the objective and focus of this report.

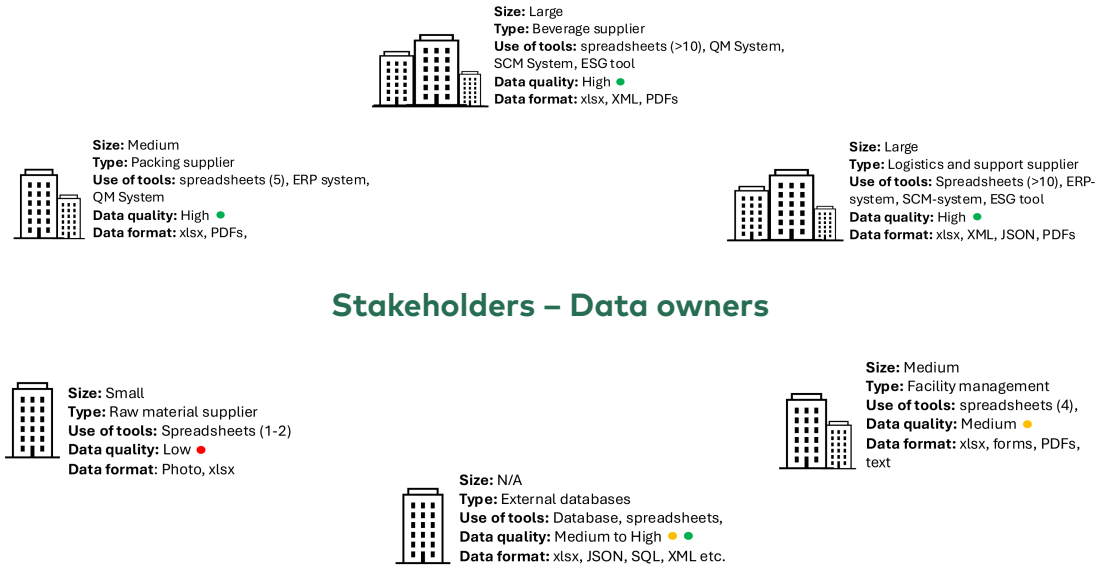

Figure 6: Illustrates stakeholders involved in the data collection: size, type, maturity (data-quality), data formats and tools they use to collect and register data in. Based on findings from the study "Circular economy transition in Denmark" (Danish Business Authorities & Deloitte, 2023)

The example in figure 6 is, of course, a conceptual archetype although based on specific "real-world" constellations. The example contains six stakeholders, but the number of actual stakeholders will vary greatly, depending on the type of company and industry. The same is true when it comes to the tools used to collect and register ESG data, and the sample types of data formats (xlsx, forms, PDFs, text, photos, XML).

The level of manual work required for ESG managers to convert datapoints into a common structure aligned with their organization's ESG metrics is dependent on the number of different data formats and datapoints, as well as the quality of the data supplied. Data quality is influenced by various factors, including the reliability of internally and externally generated data. Companies rely on the quality of data received from suppliers in their supply chain, but also the company's own ability to generate and

capture data across various systems. Therefore, all stakeholders are dependent on each other's ability to share valid data. This underpins the need for standardizing data formats, such as using the data standard inline eXtensible Business Reporting Language (iXBRL) with the data format "Extensive Markup Language" (XML), to ensure companies receive data in a single, consistent format.

3.4 Reflection of current state

As mentioned, the highly manual processes may have worked for companies till now, but with the new regulations in place, emails and spreadsheets will not be sufficient. Besides the increasing administrative burdens, there are several other catalysts that will push for the use of more advanced tools. Especially two stand out:

1 **European Single Electronic Format** (ESEF)[9], which is based on iXBRL, and The CSRD mandates companies to prepare machine-readable sustainability reports, using the ESEF format, ensuring data consistency and auditability. For this purpose, EFRAG has developed a specific ESRS XBRL taxonomy to provide a machine-readable and structured format, to conduct and publish standardized digital sustainability reports (EFRAG, 2024). Spreadsheets are not directly compatible with the iXBRL format.

2 The **assurance aspects**[10]. It is mandatory for all companies subject to CSRD, to undergo limited assurance of the sustainability report no later than 2026. This means that reports published in 2025 will be subject to limited assurance[11]. Furthermore, if deemed necessary and feasible, CSRD will become subject to reasonable assurance no later than 2028 (IAASB, 2023). This means that companies will need to provide higher levels of detail and transparency in ESG data. As an example, data must be capable of being validated and change-logged in a manner that can be audited by a third-party.

The pressure this exerts on companies to digitize processes and pursue new solutions to support sustainability reporting constitutes yet another potential risk of the SME's to be left behind in the green transition.

This naturally ties into other potential pain points companies may face when complying with the CSRD, which will be elaborated on in the following section.

9. **ESEF** is a regulatory requirement introduced by ESMA for listed companies in the EU to prepare their annual management reports in a standardized electronic format, iXBRL, and publish it in a XHTML format (ESMA, 2024). The iXBRL data standard uses the data format "XML", which allows for machine-readable data.
10. **Assurance aspects** refer to CSRD are mandating companies to undergo limited assurance no later than 2026, and potentially reasonable assurance no later than 2028 (IAASB, 2023).
11. **Limited assurance** refers to a type of assurance, which is less comprehensive reasonable assurance (financial audits). The procedures carried out to validate the content in the ESG report is less comprehensive, with less detailed tests of the data and statement provided (Shannon, 2024).

3.5 Pain points

Taking the above-described processes and practices in handling ESG into account, the pain points of the current state (AS-IS scenario) can be boiled down to (Danish Business Authorities & Deloitte, 2023):

- **Manual processes,** including manual management and collection of ESG data.
- **Difficulties in obtaining data.**
- **Non-standardized data –** data exists in silos throughout the supply chain, often in poor quality.
- **Current data formats and structures** makes it difficult to integrate data across systems.
- **Solutions are expensive** to acquire, maintain and costly in terms of change management.
- **Limited experience, knowledge and collection** of ESG data in many businesses – lack the correct competencies and resources.

If the pain points are not mitigated, a range of potential risks exist for the SME's. For example, companies that are unable to provide the requested data to stakeholders may face economic consequences (Danish Business Authorities & Deloitte, 2023), such as:

A. **Missing out on business opportunities:** For example if, as is already seen across many industries, businesses include ESG data deliverables as a requirement in their contractual agreements between trading partners. Companies not able to deliver the requested data might lose competitive ground.

B. **Reputational damage:** Investors, consumers, and business partners may perceive companies that fail to meet ESG disclosure requirements as polluting, lacking transparency or clarity in their sustainability commitments. Consequently, stakeholders might withhold investments or refrain from purchasing their products.

C. **Penalties for non-compliance:** SME's subject to CSRD (in 2027), even though the reporting requirements for SMEs will be lower than larger enterprises, will potentially be facing fines or legal consequences – if not able to report on the mandated disclosure requirements, due to lack of resources.

D. **Increased loan costs:** Companies not able to deliver on ESG data, will forgo the opportunity to pursue "green bonds". Companies lacking ESG data might face higher taxes and interest rates, compared to those who can deliver on ESG data.

Having analyzed these pain points, the next step is to consider how they can be mitigated, i.e., an optimal end state. This will be explored in the following section "TO-BE".

4. TO-BE

4.1 Overview of desired state and processes

The following section, "TO-BE", examines the desired future state of the process for exchanging climate data across borders and systems. The AS-IS and TO-BE scenarios as well as the expected requirements for closing the gap were the subject of discussion during the working group's workshops.

As in figure 4, figure 7 (the "TO-BE" overview) consists of 4 columns, which illustrate a process flow of how climate data ideally can be exchanged between relevant stakeholders in a supply chain. As mentioned, the aim of this project is to identify ways to ease the burdens associated with sustainability reporting for companies, particularly in exchanging climate data, thereby reducing the cost and challenges linked to the requirements of CSRD.

In the TO-BE scenario, manual processes are replaced by automated ones and standardized, machine-readable data can easily be exchanged via a common (public) IT-infrastructure that interacts directly with corporate IT-systems. Moreover, as elaborated on in the AS-IS section, the CSRD will impact most companies directly or indirectly through their customers, partners, or third-party requirements. This means that most companies (even if not directly subject to CSRD) will be required to exchange data at various levels depending on their role in the supply chain, impact, and size. In effect, this can mean that all companies, regardless of size or economic status, must be able to utilize the common IT infrastructure for exchanging product and climate data.

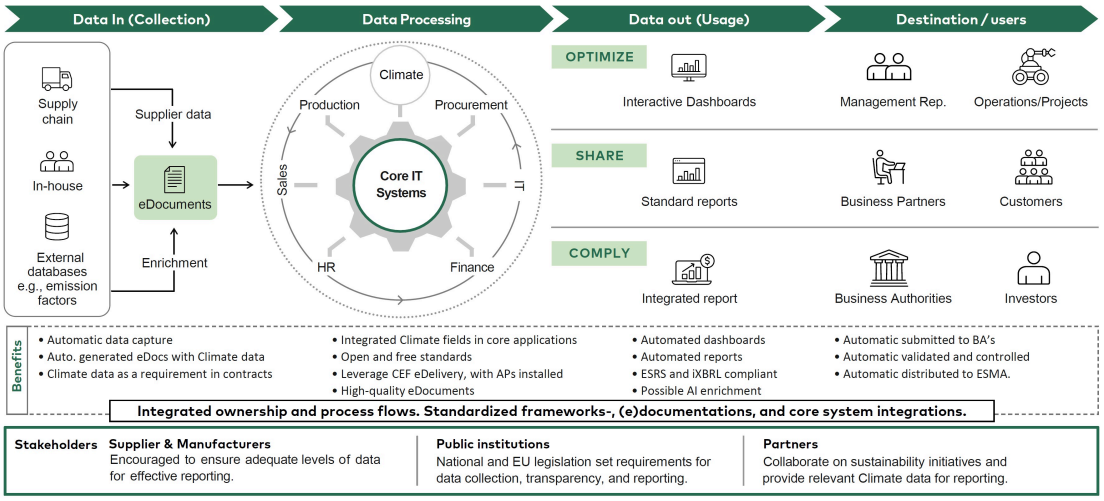

Figure 7: Illustrates the TO-BE scenario, including standardized climate data and automated data transfer between core IT systems.

In relation to this, there are multiple solutions in the market, which can facilitate the exchange of climate data, but these are, in many cases, at early stages of development or expensive for, small companies to acquire, adopt and maintain. In addition, as a result of the workshops and recommendations from reports (Deloitte & Danish Business Authorities, 2023), it was found that the best way to mitigate the challenges and administrative burdens, identified in the AS-IS section, is to utilize the existing infrastructure and building blocks around electronic invoicing cross-borders (organized by public institutions), to exchange product and climate data throughout supply chains.

Some of the reasons for leveraging existing infrastructures, are:

1. Proven, common infrastructure is already in place, with the necessary building blocks, and existing user-base.
2. Current setups are highly standardized and secure, either on public or private networks.
3. Effective data sharing capabilities that are tried and tested.
4. Ability to facilitate the necessary communication with companies' IT-systems (e.g., Enterprise Resource Planning (ERP)-systems).
5. Opportunities to increase use of automation as data and formats are standardized.

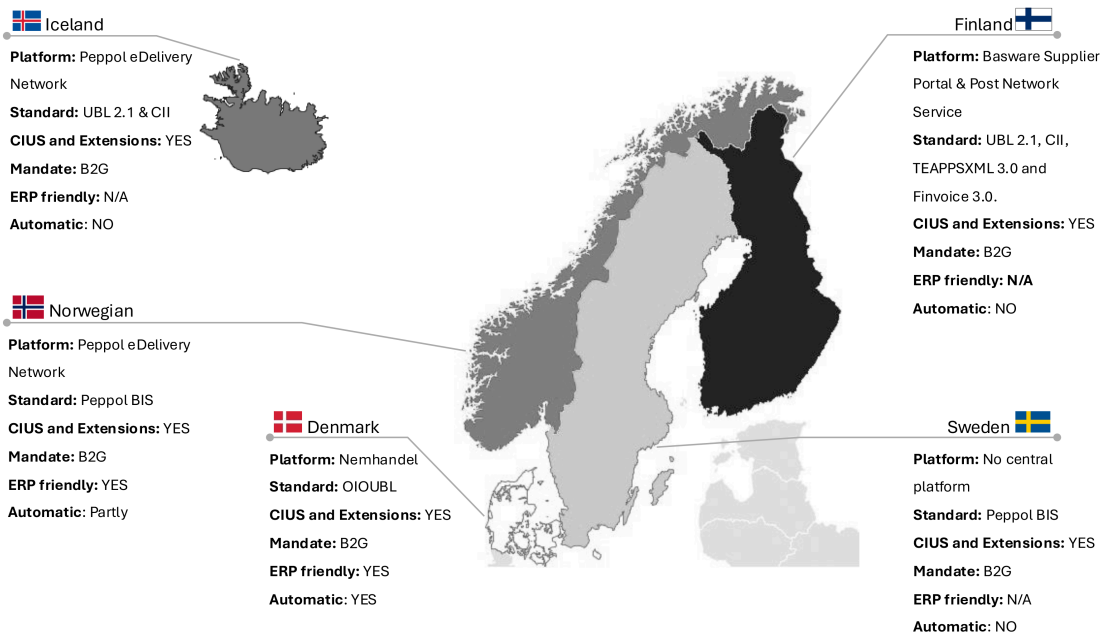

Figure 8: Provides an overview of platforms and standards used in each Nordic country, to facilitate the exchange of electronic invoices, today (European Commission, ND).

As can be seen in figure 8 above, all included countries use Pan-European Public Procurement Online (Peppol) Business Interoperability Specification (BIS) Billing, in some form or other, within their respective platforms. This is evident by the point "use

of CIUS and Extensions". This means that all countries leverage the "Connecting Europe Facility (CEF) eDelivery" infrastructure (European Commission, ND), from a Business to Government (B2G) perspective.

This, in turn, means that the eDelivery infrastructure, together with Peppol, can facilitate a secure and standardized cross-border exchange of eInvoice, eCatalogues and other relevant eDocuments containing the necessary climate data. This, of course, necessitates that all platforms are connected to the relevant access points (European Commission, What is eDelivery, ND). This setup is considered scalable and flexible.

The "TO-BE" figure 7 illustrates each company's ability to send and receive eInvoices and eCatalogues with relevant climate data, through centralized platforms via their existing core IT systems. It is recommended in the "TO-BE" scenario to enhance standardization and the options for automation by leveraging the open-source CEF eDelivery together with a relevant open free standards, such as the Peppol Network/-Framework, which can support both B2G and B2B constellations. The standardization should apply to both the internal systems and databases of suppliers, as well as climate data extracted from external databases, which is meant to be exchanged through eDocuments. Datapoints shall be aligned with ESRS standards, GHG protocol, and the ESRS iXBRL Taxonomy to be able to comply with CSRD. Still, before this digital setup will create value for receivers and suppliers, the exchanged eDocuments must include the datapoints necessary for reporting on climate data. Additional relevant datapoints, which this project has identified and finds necessary to be implemented in the eDocuments, to reach the "TO-BE" scenario, can be assessed in the "The Green Datapoints" section.

In addition to leveraging and integrating climate data across systems, it is recommended to leverage digital bookkeeping systems, which should be able to generate, store and receive eDocuments, especially eInvoices. Therefore, bookkeeping systems should be connected to Peppol and centralized platforms such as the Danish "Nemhandel solution" for handling eDocuments (European Commission, eInvoicing , 2024).

4.2 The Desired Processes of Exchanging Climate Data

To make these points clear, an example of the full process of exchanging eDocuments with relevant ESG data is presented below, in 6 steps:

1. The supplier collects the necessary data from manufacturers (potentially based on contractual agreements) or suppliers and external ESG databases. Data is stored in the suppliers ERP-system.
2. The supplier creates the requested eDocument in the procurement or ERP system. The system aligns the eDocuments with Peppol BIS Billing 3.0 standard. If the suppliers' ERP system does not have the capability to conform with the standard, adjustments within the suppliers ERP system must be made. Alternatively, the supplier can make use of a middleware solution to secure the

proper standardization and structure of the information according to the standard (Commission, 2024).

3. The requested eDocument is automatically transferred via the national platform e.g. the Danish platform "Nemhandel", which relies on eDelivery's infrastructure, to the recipients' (customers') system. The eDelivery infrastructure supports the open standard Peppol and secures a reliable exchange of the eDocument/data.
4. After receiving the standardized data, the buyer can directly use the provided ESG data in their metrics without needing to convert, calculate, or structure it to fit a "homemade setup", as both the supplier and recipient receive and collect the data in the same format and according to a specific standard. This way, the data can be displayed directly in the recipients ESG tool. If the ESG tool is not integrated with the ERP system, the data can be shared through an API, as visualized in figure 7. This setup between the ERP and ESG system can be partly or fully automated, depending on the recipients' preference (and budget).
5. The final step, before submitting the integrated report, is to ensure the technical reporting requirements of ESRS XBRL Taxonomy. Therefore, the collected ESG data from the eDocuments should be structured according to the taxonomy. By activating the ESRS XBRL Taxonomy in the eDocuments implies that the data carried by the eDocument is structured accordingly, to meet the specific requirements of the taxonomy. All data carried by the eDocuments is therefore e.g., in an XML format and tagged accordingly, which ensures interoperability with other reporting systems that the "buyer" might have.
6. Finally, the recipient has what they need to comply with the requirements for publishing an integrated report to an auditing firm, the public, and regulatory authorities in a standardized, machine-readable format, making the reports transparent, comparable, and consistent.

Given the desired state outlined in the text above, there will be challenges and risks in convincing the broader market to adopt the proposed state. These challenges will be elaborated on in the "Challenges and Risks" section.

Furthermore, the first step of the TO-BE scenario, which this project is focusing on, is to identify how relevant data for climate reporting needs can be exchanged in a standardized format, and how the standardized datapoints can be integrated in current setups. This will be elaborated on in the following section.

5. The Green Datapoints

This section explores and explains the green data points identified during the workshops and incorporated into the mockups, which are considered relevant for supporting the requirements of the CSRD and the GHG Protocol. Additionally, the report will also touch upon existing datapoints, which are deemed feasible in terms of supporting climate reporting. Descriptions of the original datapoints' functionality can be found in Peppol. No changes have been made in the original usage of existing datapoints. Additionally, this section will focus on the workshop outcomes related to considerations for standardizing and aligning green data points with applicable standards and regulations. The fields are visualized in the chapter "eDocuments and Green Data" (see Mockups).

The importance of Green Datapoints

The green datapoints[12], in this project, are critical to meet the sustainability reporting needs, particularly under the CSRD disclosure requirements, which require all companies subject to the directive to follow the GHG Protocol, when accounting for their CO2e emissions. The datapoints chosen in this project enable companies to report on scope 3, category 1 "Purchased goods and services", and provides businesses with accurate climate related data. Moreover, the datapoints within this project support the transition toward automated and standardized climate reporting across the Nordic Countries.

5.1 Categorization of Data

Out of 60 initially identified datapoints, 16 were prioritized based on their alignment with Scope 3, Category 1 reporting requirements and their practical applicability. Five out of 16 datapoints are new datapoints, which do not exist in current electronic documents and standards used across the Nordic Countries to facilitate electronic document exchange. Accordingly, the identified datapoints needed to support the reporting requirements of scope 3, category 1, have been divided into five datapoint-groups: **Product information, Product identifiers, Product measurement & units, Emission factors and Ecolabels**. Whereas the new datapoints were grouped into the groups, "Product Measurement & Units" and "Emission Factors". Therefore, the following sub-sections will touch upon the datapoint-groups, their respective datapoints and their relevance, use and functionality.

12. **Green data points** refer to data related to climate-specific aspects. This data is crucial for companies to collect, capture, and share to ensure compliance with sustainability directives or regulations, such as the CSRD. It enables reporting companies to monitor emissions and take concrete actions to identify how and where CO2e emissions must be mitigated within the supply chain in order for reporting companies to reach their Climate reduction targets.

5.1.1 Product information

Use of datapoints in relation to climate reporting:
The datapoint-group "Product information", provides the user of the eDocument with the most essential information about a specific product. The datapoints within this datapoint-group can assist and enhance transparency and traceability associated with emission data. This also includes verifying quality and trustworthiness of provided emission data. The datapoints identified within this group, can be identified as "supporting information" enhancing decision making, but also to find additional/supporting information to assist the users/recipients' ESG reporting. Additionally, the datapoints can help the user, to estimate the CO2e impact of the specific product, if emission factor information has not been provided. This can include information regarding the material, product origin or the year it was produced, to retrieve the appropriate average industry emission factor for calculating the product's or material's CO2e impact. Thus, enhancing the accuracy of climate reporting for individual products. The 6 identified datapoints already exist in the Peppol Framework today.

Below, the 6 datapoints are elaborated. The identified datapoints play a crucial role in supporting the accuracy of climate reporting:

- **Producer information:** This datapoint identifies the producer and the geographical location of the production, enabling the use of location-specific emission factors.
- **Production timestamp:** Indicates when the product was created, ensuring emission factors correspond to the correct production period.
- **Product datasheet:** This datapoint contains a link to more detailed information of all components in a product that a supplier wishes to share – e.g. a Bill of Material (BOM).
- **Material origin:** Identifies the country or region the material(s) originates from.
- **Unit price:** Represents the monetary value (cost) for a specific product or service.

5.1.2 Product identifiers

Use of datapoint in relation to Product Information:
The datapoint group "Product Identifiers" is a subgroup of the datapoint group "Product Information." The "Product Identifiers" group helps recipients/buyers recognize and track products purchased over time and across systems. The datapoints included in "Product Identifiers" enable recipients/buyers to create an overview and sort products acquired from suppliers. Furthermore, the datapoints in this group allow all relevant datapoints to be linked to each product, enabling recipients/buyers to access all datapoints associated with a specific product, at the same time. Including the datapoints in this group improves the structuring and organization of product-related data, making it more accessible and better suited to assist ESG managers with climate reporting.

The datapoints described in the following section are designed to help recipients uniquely identify purchased products and their associated datapoints, such as those outlined in the previous section. To achieve this, the use of standardized product identifiers and precise measurements becomes essential. For example, the "United Nations Standard Products and Services Code" (UNSPSC) product code standard can serve as a classification system to organize products and their related data in a structured and systematic way. The UNSPSC offers a stable framework that allows for seamless addition of new products without breaking the structure (United Nations, 2023). It is an internationally recognized and widely accepted standard and free to use. Implementing such a product code standard ensures accuracy, consistency, and interoperability in both the data exchange process and the interpretation of the exchanged data. Furthermore, using a standard like UNSPSC enhances the effectiveness of GHG Protocol calculation methods by providing accurate and standardized product identifiers.

The selected datapoints, combined with a product code standard, used to identify the products are:

- **Code Type:** This datapoints allows the supplier (creator) to choose from a predefined list of "Product Code standard".
- **Product Code:** This datapoint allows the supplier to enter the product code that uniquely identifies a product (goods and services) according to the selected product code standard (e.g. UNSPSC).
- **Product Type:** This datapoint is used to display the title of the product according to the product code standard and product code entered.

These datapoints can be provided in the eCatalogue but can also be provided in the eInvoice and Despatch Advice. Ideally, it could be copied from the eCatalogue and transferred automatically to the other relevant eDocuments. This would minimize the need for manual creation and input into other eDocuments.

5.1.3 Products measurements and Units:

Use of datapoints in relation to climate reporting:
The datapoint-group "Products measurements and Units" refers to information about a product's "physical properties", such as size, weight and quantity. This information ensures clarity of the physical dimensions and will assist an ESG manager in calculating the CO2e impact, correctly. This is important information to gather, as suppliers or manufacturers use different measurement methods for their products. Hence, some product's Unit of Measurements might need to be converted to the Unit of Measurement for the Emission factor, used to calculate the CO2e emissions. The datapoints within this group are best suited for the eCatalogue and eInvoice.

When an ESG manager needs to quantify the CO2e emissions associated with purchased products, it is necessary to know the unit in which the products are measured. For example, is the product measured in kilograms, or in liters? Therefore, the "identifiers" evaluated in the section above is not sufficient information, if the receiver does not know the correct measurements of the purchased product. Therefore, it is recommended to use measurement figures that relate to a single unit, for each sold product. The datapoints to support this, are as follows:

- **Measurement:** Refers to the quantity of products delivered or purchased. The measurements of products can in most cases be retrieved from the "product master data system".
- **Unit:** Refers to the type of unit in which the product is measured and ensures the correct CO2e values can be calculated according to the given CO2e emission factor(s).

Furthermore, the datapoint "Unit of measurement" could be automatically populated if the unit of measurement has been linked to a product code, such as UNSPSC. Unit and Measurement can be implemented in both the eCatalogue and eInvoice.

5.1.4 Emissionfactors:

Use of datapoints in relation to climate reporting:
The datapoint-group "Emission factors" refers to information concerning the CO2e emissions for a product. This information assists the ESG manager in calculating or retrieving the CO2e emissions for a specific product. Also, it creates transparency in how e.g. the CO2e emissions have been estimated and validity in the ESG report. These datapoints are crucial, when considering companies must undergo "limited assurance" (cf. the AS-IS and TO-BE sections), to comply with CSRD. The datapoints are best suited for both the eCatalogue and eInvoice. The datapoints are needed for ESRS Disclosure Requirements, E1-6 – Gross Scopes 1, 2, 3 and Total GHG emissions.

The datapoints outlined in this section support the GHG protocols' Supplier Specific, Hybrid and Average-data calculation method. In general, emission factors can either be product-specific or derived from industry-average values provided by the seller (supplier). The datapoints suggested below aim to create validity and transparency for the emission factors provided in the eDocuments. The datapoints are as follows:

- **CO2e Factor in kg per Unit Sold**: refers to a field in which a supplier (creator) can enter their calculated "Emission factor" in kg CO2e per unit sold. Kilograms was selected due to being the most common used unit, concerning the value provided for CO2e.
- **CO2e source Information (Specific/General):** This datapoint specifies the source of the CO2e calculation. The "Specific" option indicates that the supplier has provided a supplier-specific emission factor, while the "General" option indicates that the supplier has used an industry-average emission factor. The industry-average emission factor is calculated by a third party and considers emissions from hundreds or thousands of products, within that industry, for that type of product.
- **URL to the CO2e Calculation Source:** This datapoint refers to a field where a link can be entered. The link enables the recipient to identify the calculation method used and provides detailed information about the emission factor, thereby enhancing transparency.

5.1.5 Ecolabels:

Use of datapoints in relation to climate reporting:
The datapoint-group "Ecolabels" refers to information of recognized and approved certificates/labels for products there have been purchased. This information certifies the sustainability claims of the supplier's products, thereby legitimizing them and building trust among the product's users.

Ecolabels are labels, typically placed on product packaging to help consumers, businesses, and institutional procurement specialists to quickly and easily identify products that meet specific environmental, health, safety, social, and ethical performance criterions, and can therefore be considered "environmentally friendly".

Ecolabels can be used in eCatalogues and eInvoices, therefore the following datapoints are recommended to be used across eDocuments, to legitimize and build trust among the products users:

- **Ecolabel:** For this datapoint, suppliers should provide the name of the Ecolabel obtained for the product, such as the "Nordic Swan" label.
- **Ecolabel Code**: Refers to a code that identifies the ecolabel using an open, free standard, such as the Peppol Framework.
- **URL to the Ecolabel**: This datapoint allows for the supplier to provide a link to a digital version of the Ecolabel, for the specific product. This allows the recipient to access detailed information about the certification. Thereby, it ensures transparency and create trust towards the recipient in relation to the products' sustainability claims.

5.1.6 Alignment with CSRD, GHG Protocol, and interoperability frameworks:

Why it is important to align with CSRD, GHG Protocol and interoperability framework:

This section dives into how the identified green datapoints relate and align with the CSRD, GHG Protocol and interoperability framework(s). The result of aligning these, will streamline the data exchanged, in relation to CSRD reporting requirements and create interoperability across the borders and companies. Focusing on the practical application of the datapoints, such as "product identifies" or "Emission factors" illustrates the compliance benefits for users using electronic documents, if the suggested datapoints, are implemented in the necessary documents. Aligning the datapoints with an interoperability framework, which relies on data standards, means that the datapoints suggested will be applicable here and now, but also in a long-term perspective.

The proposed datapoints to be implemented in the eInvoice and eCatalogue mockups intend to assist all users, especially within companies that do not have the opportunity or ability to share and collect climate data in an efficient manner. In many cases, companies are unable to share supplier-specific emission factors or Life Cycle Assessments (LCAs) for specific products because conducting LCAs can be costly, and finding relevant industry-average emission factors can be challenging. Especially for SMEs with limited resources. Therefore, the recommended fields not only provide information related to the datapoint-group "emission factors" but also offer supporting information if no data for emission factors have been provided. By including supporting datapoints in eDocuments, such as product information datapoints, recipients can independently identify industry-average emissions factor to support their CO2e emission calculations, if the supplier has not provided emission factor-related datapoints in the respective eDocument(s). The datapoints recommended have been assessed and aligned with the **ESRS E1 Standard**, the **GHG Protocol** and the interoperability framework, **Peppol**, with the intention to standardize the data according to their specifications and requirements (see appendix 3). This alignment streamlines the data collection and enables automatic transfer. Additionally, it allows the datapoints to be seamlessly integrated into the sustainability report and analytical systems for further investigation.

5.1.7 The datapoints in relation to the GHG protocol

The following subsection examines the green datapoints usability in relation to the recommended calculation methods in the GHG Protocol.

Reflecting upon the data availability from a reporting company's point of view, the GHG Protocol endorses four calculation methods to calculate products CO2e emissions, within scope 3, category 1, "Purchased goods and services" (Barrow, Buckley, Clummis, & Draucker, 2013). The calculation methods can be assessed in figure 9:

Calculation methods	Description of data needed
Supplier-specific method	The reporting company collects supplier-specific data, specific to that product.
Hybrid method	The reporting company collects a combination of supplier-specific activity data and secondary/average data to fill gaps.
Average-data method	The reporting company collects data on e.g. the weight, or other relevant units of the acquired products and gathers industry-average emission factors from external databases or sources to estimate the CO2e emissions.
Spend-based method	The reporting company estimates their emissions by collecting data on the economic value for the purchased products and multiplies it by relevant average data (secondary data).

Figure 9: Provides an overview of the four calculation methods recommended by the GHG Protocol for scope 3, category 1 calculations, and a short description of the type of data needed for each method – based on "Technical Guidance for Calculating Scope 3 Emissions" (WRI & wbcsd, 2013)

The following text will consider all four calculation methods with respect to the datapoints identified in this project, starting with the "spend-based" method. This is the least precise calculation method, as seen in figure 9, in terms of estimating CO2e emissions for a product or service. Through the spend-based method, CO2e emissions are estimated by multiplying the product's price by an emission factor. In this regard, while prices can indicate the CO2e emissions - e.g., higher-priced products may have longer lifespans or eco-friendly materials – applying this method often provides a misleading picture. For instance, in cases where the same emission factor has been applied to both an older and a newer version of a product, despite price differences, it often shows the product with the higher price has greater CO2e emissions. Therefore, this method should only be used as a last resort when no other data is available. Supporting datapoints like "Product Type," "Amount Ordered," and "Unit of Measurement" can help improve accuracy by enabling access to more precise emission factors from external databases.

Regarding the **Supplier-Specific calculation method**, the most accurate and reliable approach, suppliers are required to provide specific CO2e figures for every purchase. The datapoints required for this method include "CO2e factor in kg per unit sold" and confirmation that the datapoint "CO2e source information" is set to "specific". Yet, if the specific CO2 emission factors are not known, available or only account for some of the products' life cycle, the reporting company can make use of the average data or hybrid calculation method. Using the **average-data method,** requires that the supplier has filled out the datapoints: "Unit of Measurement", "Product Type" and "Material Origin". This allows the reporting company to accurately identify the appropriate industry-average emission factor to calculate the CO2e emissions of the product.

Regarding the **hybrid-method**, it requires that the datapoints within the "Product Information" and "Product Measurement and Units" datapoint-groups are filled out. More specifically, the data needed is data such as mass, volume of the material used in the product, disposal, waste information etc. This enables the reporting company to identify appropriate secondary emission factors or fill out the gaps to calculate the full CO2e emissions of the acquired product.

5.2 Recommendations

The most important factor to support climate reporting is high-quality and reliable data. Therefore, concluding on the above section "The Green Datapoints", assigning a unique code to each product ensures stability and structure, facilitating international use.

To enhance the reliability it is also recommended to link "Unit of Measurement" to a product code list, such as UNSPSC. Implementing an international product code standard which includes both goods and services, would potentially assist sustainability reporting and enhance search functionalities of datapoints associated with each product, relevant to climate reporting. Hence, making climate reporting more efficient. However, the product code standard must be neutral and free to use, to become appealing. Furthermore, the UNSPSC is also recommended to be implemented, as it is often used in the Peppol Framework to classify products in electronic invoices and electronic procurement. Additionally, since the standards are not maintained by the same organization, there would be a need to create a new working-group responsible of connecting the standards and maintaining the continuous updates. There needs to be a maintenance process that clearly stipulates responsibilities. Additionally, it can be concluded that the green datapoints presented, can be used in association with the four calculation methods recommended by the GHG Protocol. This makes the datapoints recommended in the above section relevant for all reporting companies that need to report on their CO2e emissions within scope 3, category 1 "Purchased goods and services". Additionally, it can also be concluded that the Ecolabel datapoint-group can be used to verify and legitimatize product's sustainability claims, hence, avoid greenwashing of products sustainability claims.

6. eDocuments and Green Data (mockups)

This section will break down how the mockups were developed and enhanced throughout the workshops. In addition, this section also intends to visualize how the discussed datapoints of the section "The green datapoints" has been incorporated in the mockup, respectively for the eDocuments;

1. **eInvoice and**
2. **eCatalogue.**

6.1 Approach

As stated in the methodology section, the purpose of the first workshop, with experts from the Nordic countries, was to identify and define the specific datapoints required in the process of climate reporting regarding purchased products (goods and services) and to identify in which eDocument the datapoints are best suited.

Subsequently, the datapoints were clustered and integrated into several versions, to reflect and illustrate the complexity of the datapoints on different levels. The rationale behind it, was for the experts to identify the opportunities, complexity and challenges regarding standardization of the datapoints used in the different levels of the mockups.

The reasoning behind developing a mockup is that it provides:

1. Enhanced communication of the recommended datapoints for this project – **communication tool**,
2. Enhanced stakeholder collaboration and involvement – **feedback**,
3. Simple way to demonstrate the outcomes – **test of usability**, and
4. Easy to adjust the mockup, according to feedback – **saves time and ensure flexibility**.

The mockups therefore serve as a communication tool for the functionalities and opportunities for the recommended datapoints in the respective eDocuments, to stakeholders in the different Nordic countries and the EU. Although, it is important to remember that the final eDocuments' design is determined by the service providers. Namely, all service providers have their own way to design the eDocument why the main purpose with creating mockups is to provide the stakeholders with a visual image of how it could look like, and guide service providers on how and what datapoints should be implemented. The same relates to some of the functionalities for the setup, as some service providers offer other functions regarding datapoints.

An eDocument can be considered a "container" that holds information related to procurement between a supplier and a customer. For this project, climate data needs to be incorporated into this "container." However, not all climate data fits into every "container" (eDocument), nor is it expected to by either the supplier or the customer. Therefore, it is important to ensure that the relevant procurement and climate data within the eDocument/container is delivered to the correct recipient and that the recipient knows what data can be expected inside the eDocument. This understanding is crucial for the recipient to automate and efficiently handle the climate data upon its arrival, depending on which eDocument the recipient receives.

Therefore, this project recommends to utilize standardized open and free networks such as Peppol, to facilitate a secure and reliable sharing of eDocuments, in this case "climate data", and secure that the correct eDocument with the respective climate data are sent to the correct recipient in an understandable, efficient and standardised format.

6.2 Development of Mockups for Climate Data Exchange

The mockups were created by grouping the identified datapoints within the relevant eDocument types, to align with specific categories of information.

At the beginning of this project, all eDocuments were considered as optional containers for a datapoint. Nonetheless, later analysis and discussions of the datapoints during the workshops showed that they were best suited to be carried out by the eCatalogue and eInvoice. Some of the new datapoints were deemed relevant to other eDocuments, such as the despatch advice and eReciept, but the eInvoice and eCatalogue has more relevance in carrying the identified datapoints than the others, which is why only mockups for those two were created.

Although the eCatalogue is not widely adopted in the Nordic countries, with the exception of Norway, it was concluded (in collaboration with eDocument experts) that the eCatalogue is best suited to carry all the identified datapoints. This makes it the most comprehensive eDocument for containing green datapoints. The reason behind this is that if other eDocuments were to include the recommended datapoints, they would become too cumbersome and burdensome for their intended functionality.

All datapoints were further clustered and sorted into activity groups to make the datapoints easier to understand and work with. The cluster analysis was based on existing Peppol semantic datatypes where relevant. However, the semantic datatype "Emission Factor" shall be considered as "subgroup" to the group "Additional Items". The reason for using the "Additional Item Property" group lies in its provision of a standardized XML format for electronic business documents, making it applicable across all types of eDocuments. By doing so, it will also align with the data format used in iXBRL, which is the standard required for sustainability reporting under the CSRD. The XML format allows the data to be machine-readable, enabling the automation of the recommended datapoints to be transferred seamlessly across systems and documents. This ensures consistency and interoperability across different systems and countries. Furthermore, considering that the Additional Item Property group belongs to

Universal Business Language (UBL), an ISO standard, the suggested datapoints could potentially be incorporated directly into the EU-Norm.

In addition, the addtional datapoints addressed in this report resides in their existing datagroups, according to Peppol.

To keep the mockup design familiar and maintain the recognition factor, the mockup of the eCatalogue were inspired by the recognized "Statens og Kommunernes Indkøbsservice" (SKI) catalogue. The SKI-Catalogue refers to a electronic service or product catalogue which is used in connection with contractual agreements between a public institution and a supplier. Further, the datapoints which were selected to be most suitable for the eInvoice were very similar to datapoints identified in another project conducted by the Danish business authority (Erhvervsstyrelsen), where a mockup also was developed for the purpose of testing new green datapoints together with private companies. The eInvoice mockup design was selected from that project.

With the selected design and clustered datapoints, the mockups were created and elaborated upon in workshop 2.

In relation to validating and developing the mockups for the respective eDocuments, it can be concluded from the workshops that the usage of datapoints and regulatory requirements varies within the Nordic countries. This complicates the clustering of the datapoints identified in the specific eDocuments and only amplifies the need for standardization of the datapoints cross-borders and across all eDocuments, considering the scope of the project. In addition to this, there is a need to ensure that the datapoints recommended have uniformed definitions and functions across all eDocuments and countries, to ensure consistency and interoperability. The datapoints and formats developed and used in the mockups therefore need to be compliant with current regulations and requirements across the Nordic countries.

The three levels of mockups, which illustrated the different complexities in terms of the use, maturity and number of datapoints included in each eDocument, cf. the methodology section "Workshop 2", provided the foundation for the development of the final mockups for the eCatalogue and eInvoice. In collaboration with the experts from Workshop 2, it was concluded that only a few datapoints should be implemented in the respective eDocuments, in order to keep them as simple and non-overwhelming as possible for the users.

This approach of developing mockups was selected to support the goal of the project and to simplify the illustration of how and what green datapoints should be shared. To reach the goal, it is of most importance to understand, as mentioned earlier, the best location of the different datapoints and their functionality, so the eDocuments can provide the necessary value to sustainability reporting for the companies subject to CSRD.

The next sub-section will therefore elaborate on the eDocuments functionality and how the datapoints can be integrated in each eDocument.

6.3 Description and Functionality of recommended Mockups

As mentioned earlier, the mockups work as a visualization of how the datapoints can be integrated in different eDocuments. The selected mockups for eInvoice and eCatalogue are presented below.

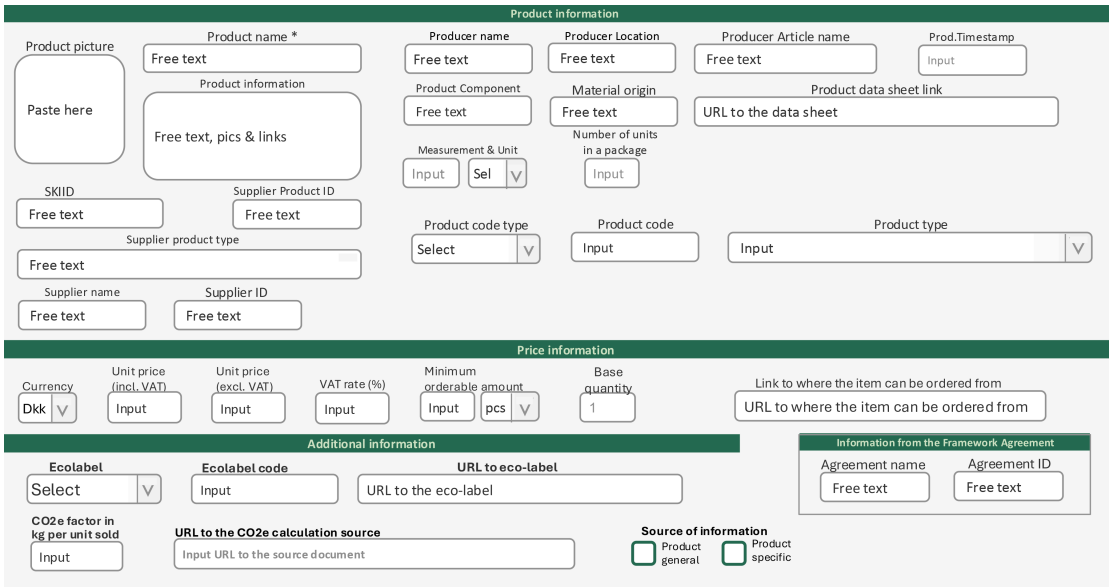

Figure 10: Illustrates an example of an eCatalogue with the recommended datapoints. Data fields with bold font are datapoints addressed in this report.

The datapoints presented does not represent all possible datapoints that can be carried out in the specific eDocuments. Hence, more datapoints can be considered in the future work of incorporating ESG and climate related data in the eDocuments. Figure 10 represents a mockup of the eCatalogue, in which the recommended datapoints have been included to support climate reporting. The climate related datapoints have been highlighted with a bold font.

The eCatalogue carries out information about products, goods and services that are up for sale. The intention with an eCatalogue is for the supplier to provide information regarding their product, to secure that a procurement person has all the needed information details available, to make a sustainable decision regarding the company's procurement needs. The datapoints currently included in an eCatalogue support the financial aspects of decision-making. With the implementation of the recommended datapoints, users will also be able to base their decisions on CO2e emissions and sustainability claims, thereby supporting green electronic-procurement (e-procurement) - especially if these green datapoints are standardized across eDocuments and borders, as outlined in the TO-BE scenario. If standardized and incorporated across eDocuments and borders, it will potentially save resources and time compared to the manual processing of collecting climate data today (cf. the AS-IS scenario). Since the datapoints ideally are standardized and eDocuments are interconnected, the user does

not need to repeat the same information in multiple eDocuments (depending on the service provider), assuming that the catalogue is updated with the most applicable and updated information. Hence, in a potential procurement scenario and when a procurement person requests an eDocument, the information will be distributed throughout the entire procurement process – from browsing products or services in an eCatalogue to the monetary transaction has gone through from the buyer to the supplier.

By standardizing the datapoints it enables the supplier's system to automate the creation of the catalogue and enables the recipients' receiving system to recognise the received information.

Furthermore, a indicated for the eCatalogue, the eInvoice is another eDocument which also contains product information and is an important building block of the procurement flow. If the procurement process starts with the catalogue and all required information is provided accordingly, the information needed in the eInvoice, which also exist in the catalogue, can be automated. Moreover, figure 11 illustrates the eInvoice mockup developed throughout the workshops. The new datapoints recommended has been highlighted with bold. On top of that, the eInvoice contains additional information that is not included in the eCatalogue, namely "net emissions," which are calculated by multiplying the number of items ordered ("Amount") by the CO2e factor for one item. This is because the eCatalogue does not have information about the quantity of items ordered, and therefore, net emissions cannot be provided in the eCatalogue.

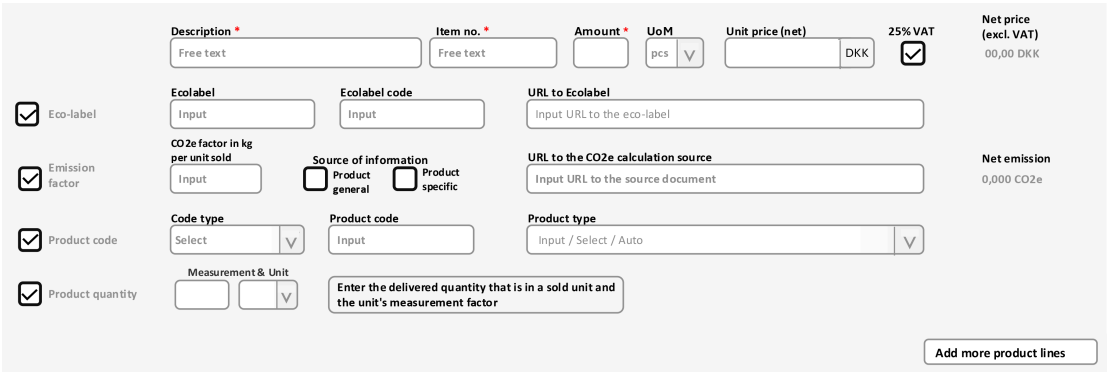

Figure 11: Illustrates an example of the eInvoice with recommended datapoints. Data fields with bold font are datapoints addressed in this report.

Furthermore, since eDocuments are used differently, in the matter of which eDocument is involved in the process, across the Nordic countries, this project recommends and advocates for the opportunity, which allows for additional sustainability information in the eInvoice. Allowing additional sustainability information in the eInvoice creates an opportunity for suppliers and buyers, not performed through an eCatalogue, to provide additional sustainability information in the eInvoice. However, the responsibilities or burdens for the seller on supplier side in terms of securing that the information is correct in the relation to their ERP and transaction systems, will increase. Figure 11

illustrates a mockup of an eInvoice with the recommended datapoints relevant for reporting climate reporting. In addition to all the above, the procurement flow in terms of document management is already handled by the Peppol Network, today, meaning no further development is needed in this regard (c.f. the TO-BE section). Furthermore, Peppol also ensures that only legal parties can enter the procurement process making the use of eDocuments trustworthy and secure.

6.4 Recommendations:

During the workshops and analysis of the datapoints and their location, it was discovered that most datapoints were best suited to be incorporated and located in an eCatalogue and only a few datapoints were suited to be carried by other eDocuments.

Additionally, it was discovered that the eCatalogues are not widely used or adopted by business or authorities in most countries, except for Norway who is running a pilot for adopting eCatalogues. With the different frequency or small utilization of the eCatalogues across the Nordic countries makes it more challenging to promote the catalogue as the recommended eDocument carrying the most essential green data for companies to support their sustainability reporting needs. Hence, promoting the eCatalogue as the main repository for green data and as main method to share the datapoints among different organisations can potentially create inefficiencies or discrepancies, not only in exchanging data across the Nordic countries, but also on a national level.

Promoting and making eCatalogue mandatory through legalization would be a potential solution. On the other hand, it could also impose extra burdens on smaller organisations, which is why it is recommended that other eDocuments need to be able to carry some or all of the most significant datapoints, in relation to climate data reporting needs. The most essential part is, however, not which eDocument is used to carry out the significant datapoints, but it is rather to make sure that the datapoints in the specific eDocument are understood correctly, standardized and applicable for both the suppliers' and recipients' systems. In relation to this, a network/framework such as Peppol, can facilitates this, but it should be emphasized that the green datapoints are required to be standardised and fixed, so all parties can optimize or change their involved systems and tools accordingly. When the datapoints have been agreed and standardized, both semantically and technically, integration with other systems and tools will be easier and the organisations do not run risks, in terms of them needing to redo the work of integrating the information.

7. Data Integration, Automation and Technical Frameworks

The following section investigates how the identified datapoints in the "The Green Data Points" section can be integrated in current digital setups. Furthermore, considerations regarding what is needed to integrate the identified datapoints are explored. Also, broad considerations around how the datapoints potentially can be integrated in commonly used tools, are considered as well.

As depicted on in the key-objective section, this project explores how Nordic cross-border collaboration can reduce administrative burdens and facilitate green procurement through improved climate data exchange. To reach the objective of this project, solutions on how to integrate the climate related datapoints need to be considered. This section provides reflections and considerations of what relevant service providers of eDocuments should consider and be aware of when integrating the climate-related datapoints.

7.1 Technical Requirements for Climate Data Integration

To succeed with the integration of the identified datapoints from the "The Green Datapoints" section, some groundwork needs to be covered. Groundwork in this case refers to securing the datapoints are correctly defined accordingly to the Peppol standard and are recognized in the sending system. A sending system refers to a system, which is responsible for generating and preparing the datapoints within an eDocument. This can for example be a dedicated ERP system, middleware software or integrations layers, which facilitates this. In addition to the sending system and as referenced in the TO-BE scenario, the sending system shall ensure the data is generated in the correct data format, ensure compliance with Peppol, OIOUBL and other local/national relevant standards, so all Nordic countries can utilize the datapoints. In this project, the datapoints have received a considerable amount of attention in the workshops. The reason for this is that the datapoints form the foundation for the information needed for the receiver, buyers, and ESG managers to report on scope 3, category 1 and to meet the requirements of CSRD, within ESRS E1. The datapoints aim to ensure, as mentioned throughout the report, trustworthiness, reliability and validity within the ESG report and supports general reporting activities. Nonetheless, information and further investigation of the datapoints in relation to their technical specifications are still needed, to ensure their feasibility and correct level of readiness for integration, before specific integration guidelines for the service providers can be developed. In response to that, the datapoints needs to be evaluated in terms of assessing their quality, application and availability (matureness) in general, and investigate how they align and if they are compatible with the CSRD, ESRS and Peppol Standard. Although, efforts have been made to define the semantic definitions for the

datapoints (see appendix 3), the semantic definition of the datapoints originating from this project should be considered as a first draft. Therefore, it is recommended to test the datapoints together with companies subject to CSRD and technical experts.

To ensure compatibility of selected datapoints across Nordic countries, it requires all parties involved to agree upon their technical and semantic definitions and specifications, before being able to standardize them correctly. Standardizing the datapoints require that the metadata for each datapoint is agreed upon, by all parties involved. This includes ensuring technical naming, linking related datapoints, and defining fields clearly. This should be in place before being able to do a meaningful integration of the datapoints. Furthermore, another argument to support the importance of standardizing the identified datapoints, is that the datapoints are to be used or can be used in calculations. Lack of standardization leads to inaccuracies, inconsistencies, and increased manual work for ESG stakeholders, as depicted on in the AS-IS and TO-BE sections.

Additionally, the technical definitions need to reflect and declare the characteristics of the datapoints', the format and length restrictions of the field. This can be done by for example comparing the semantic definition of the datapoints with existing ones in both suppliers and recipients' systems. This aspect is particularly important to avoid any confusion or inaccuracies. For example, a datapoint like "CO2e factor in kg per unit sold" could be mistaken for a datapoint presenting the CO2e factor for one base unit. These reflections highlight the need for technical guidelines to ensure consistent data integration, processing and how to utilize them correct.

7.2 Technical Guidelines

With the above reflections in mind of what is needed regarding standardizing the datapoints and why, the next part of this section will focus on what potential guidelines shall consider, address and entail (high-level reflections).

First, it is important to take into consideration that large, medium and small enterprises use different levels of systems/tools to manage the datapoints, which creates an incentive/argument for the guidelines to be created without being dependent on a specific system or tool.

The guidelines need to address and present the following:

- Align guidelines with calculation methods outlined in the GHG protocol.
- How to handle and utilize datapoints.
- Address system restrictions, such as software limitations or data accessibility issues. When the datapoints are identified in suppliers' system eventual restrictions and access methods need to be identified and handled if necessary.
- How to update datapoints and evaluate current processes, potential risks, and system dependencies to prevent any unintended overwriting of critical data. If not updated and evaluated properly, the data quality can easily become error-full leading to incorrect or error-full data being sent and received between the parties.

- How to choose and navigate the landscape of open and free standards, such as the Peppol Framework. For example, Peppol provides a simple architecture based on a four connections model, which allows the sender and receiver to exchange information without creating a unique point-to-point connection or use the same service provider. Nonetheless, for parties to use an open and free standard with a simple architecture, such as the Peppol Framework, it is required that all parties use a service provider that adheres to the ISO/IEC 19845 standard.
- How to secure the datapoints and ensure their conformity with open and free standards, such as the Peppol Framework. This should always be done, even if the e-procurement partners are manually copying the information instead of using an automated process. Initially if doing so, helps minimize the manual workload for the receiving e-procurement partner.

With respect to the last bullet point concerning choosing and navigating the landscape of "open and free standards", it is worth considering that the open and free standard "Peppol Framework" provides the methodology and technical specifications, as well as an agreement framework (Peppol's three pillars) to send eDocuments between e-procurement partners. By selecting a service provider who adheres to the ISO/IEC 19845 standard, hence the Peppol Network, the e-procurement partners will also have sufficient support regarding complying with country specific regulations. Therefore, the e-procurement partners do not need to worry about compliance issues, as the chosen service provider will ensure that the required information is sent to the recipient's system(s) in the proper format, compliant with the specific requirements of each country. Additionally, depending on the chosen service provider, all Peppol-standardized datapoints are supported in the solution. This means that even if a datapoint is not required in the supplier's country, it can still be automatically included for trading partners in countries where it is mandatory due to specific regulations.

7.3 Recommendations

Considering the reflections and considerations made in the above section, it is recommended to leverage existing infrastructures, such as Peppol, to simplify compliance with CSRD and streamline green data sharing. Using existing infrastructures and open and free standards will mitigate the current challenges as reflected in the AS-IS Scenario and ease the burdens of sharing green data. Hence, it will mitigate manual work such as structuring and converting data, to the correct format, following the correct standard. Furthermore, it is recommended that guidelines are developed with the purpose of helping service providers to integrate the new datapoints correctly, comprising how to ensure the conformity, update datapoints, how to use the datapoints according the GHG protocol etc.

8. Challenges and Risks

The following section examines and elaborates on the challenges and risks associated with adopting the recommendations and initiatives outlined in this report. Additionally, a prioritization of the challenges and risks that require the most attention will be presented through a two-dimensional "Risk Matrix".

This section outlines the challenges and risks associated with the report's recommendations, focusing on critical areas for further investigation and mitigation. While this report does not detail national differences, it highlights apparent gaps and provides a foundation for further analysis.

In the end of this section, a "Risk Matrix" is presented to help manage, evaluate and prioritize the risks identified, based on their probability (the likelihood that the risk will occur) and the estimated impact (the expected magnitude of the consequence if the risk occurs). The matrix serves as a guide to prioritize and address critical risks affecting the implementation of the recommendations, regarding efficient exchange of climate data for businesses to calculate their climate footprint (cf. the objective of the project).

8.1 The respective challenges and risks:

This section will examine the potential difficulties, risks, and obstacles that may arise in implementing the recommendations. Each sub-section addresses a recommendation, alongside associated challenges and risks. These recommendations are based on the project teams' discussions and should be considered an initial reflection that can serve as the foundation for further specific and detailed analysis or mitigation planning.

8.1.1 Lack of resources to deliver on required information:

Description of recommendation: The report recommends that all businesses, regardless of size, should be able to utilize eDocuments and the current digital setup.

Challenge: Suppliers, especially small organizations, might lack the necessary skills, tools, and knowledge to obtain the requested information, particularly with the new datapoints recommended for implementation in the eDocuments, to support CSRD reporting needs.

Risk 1: Organizations unable to obtain and deliver on the requested data may result in the following consequences:

- Lose competitive ground – market share decline.
- Increased market prices, as there can be fewer suppliers to select from, who is able to deliver "favorable" products with the data needed to compliment the eDocuments. Hence, supply of "favorable" products in the market can decline and if demand remains the same it can create bottlenecks in the supply chain for the "favorable" suppliers.

8.1.2 Limited adoption of eCatalogue

Description of recommendation: The report recommends making use of the eDocuments and the current digital setups, to facilitate the exchange of product and climate data between companies (cf. the TO-BE and integration section).

Challenges: Currently, eDocuments are used differently across countries. For example, Norway uses eCatalogues to a greater extent than Denmark, Sweden, Finland, and Iceland. Consequently, countries not utilizing eCatalogues may not experience the same benefits as Norwegian businesses or have access to the same amount of data, as eCatalogues often provide a better foundation for more detailed information on products.

Risk 2: Limited adoption of eCatalogues could lead to disparities in the level of information available for businesses, such as product information needed for climate and CSRD reporting.

8.1.3 Adoption of Peppol and interoperability with non-Peppol systems.

Description of recommendation: The report recommends utilizing the Peppol Network/Framework to facilitate the secure and standardized electronic exchange of product and ESG information, through relevant eDocuments.

Challenges: Some actors and key stakeholders are unfamiliar with the Peppol Framework hence, not all companies may be ready to adopt the Peppol Network, as they e.g. are using other similar, but different frameworks. Some of the frameworks in place, used to facilitate the electronic exchange in the different countries, are not directly compatible or not comparable with the Peppol Network/Framework.

Risk 3: The challenges above can lead to a slow adoption by some actors, as some stakeholders may resist the change, resulting in delays (lack of buy-in among stakeholder), errors and inconsistencies in data formats.

8.1.4 Cost barriers

Description of recommendation: The recommended datapoints in this report are developed and recommended to be implemented in the current digital setup, to support the reporting needs of companies. However, the recommendation of these datapoints

relies on Peppol and CEF eDelivery, being used to facilitate the electronic exchange of these datapoints.

Challenges: Stakeholders' current digital setups not relying on the Peppol Framework, can be met by barriers, such as cost-barriers. For example, the need to use third-party service providers to do the necessary implementation, adjustments or integrations to current setups, can be expensive.

Risk 4: Cost barriers may discourage SMEs from adopting Peppol, exacerbating market inequalities and therefore increase the risks in 8.1.1.

8.1.5 Non-standardized approaches to calculating emission factors.

Description of recommendation: The "The Green Datapoints" section, recommends implementing 3 datapoints, under the datapoint-group "Emission Factors", which intends to support the companies in exchanging emissions factors and relevant information related to them.

Challenges: While multiple methods like GHG Protocol standards exist, no common standard for calculating emission factors has been established.

Risk 5: As there are no common approach to calculate emission factors, a risk can occur, in terms of unreliable or incomparable data, due to the use of different methodologies. It may therefore be difficult to compare emissions internally and across businesses and industries, with high accuracy.

8.1.6 Futureproofing and scalability

Description of recommendation: Through the report, it has been recommended to use the current digital setup, CEF eDelivery infrastructure, together with Peppol, as they are designed to be scalable.

Challenges: Frequent updates to Peppol are essential to accommodate the rapid evolving ESG reporting requirements. However, implementing new datapoints in the Peppol Network is a time-consuming process, that often takes at least a year.

Risk 6: Assuming that Peppol does not evolve fast enough to meet the requirements from regulations and companies, the use of the Peppol framework becomes redundant, as it would create gaps in the reporting needs, making the exchange of product and climate data less efficient.

8.1.7 Change management with regards to adopt new datapoints:

Description of recommendation: The report introduces and recommends 5 additional, new datapoints, which are not directly included in the Peppol framework or eDocuments, to be implemented in the respective eDocuments, to support the reporting needs of scope 3, category 1.

Challenges: Introducing new datapoints in eDocuments may face stakeholder resistance, as the suppliers might not be in possession of the relevant data or find it time-consuming to fill in the data in e.g. the eCatalogue. Especially for companies with

limited resources, such as SME's. Furthermore, many stakeholders have limited experience with this type of data, making them unsure whether the datapoints are accurate, precise and filled in correctly. This challenge is supported by investigations and reports that the participating agencies have created with specialists and advisors.

Risk 7: Resistance from stakeholders in adopting and reporting on the new datapoints could result in non-compliance for reporting companies, as they would be unable to include the relevant emission data from these stakeholders.

8.2 Other initiatives and reflections

This section considers other initiatives, which can affect the ability to succeed with the recommendations put forth in this project.

8.2.1 Digital Product Passport

Description of recommendation: The European Union has started to implement a new regulation requiring nearly all products sold in the EU to feature a Digital Product Passport (DPP) (European Union, 2024). The DPP is designed to close the gap between consumer demands for transparency and the current lack of reliable product data (European data , 2024).

Challenges: DPP shall provide comprehensive information about each product's origin, materials, climate impact, and disposal recommendations which would replace the need for the recommendations made in this project. However, the widespread implementation of the DPP is faced with the same (as well as other) challenges outlined in this project. For this reason, it is sensible to consider the coupling between these initiatives.

Risk 8: Adopting the recommendations outlined in this report and adding changes to e.g. existing infrastructure and digital setups can become obsolete, due to the requirements of DPP.

Reflections: DPP will be rolled out in phases where the first product (batteries) is expected to be ready in 2027 (implementation time is not included) and additional industries and products are then to follow (Faraca, et al., 2024). Other categories will be implemented in 2030's. Thus, making the DPP a non-viable solution in the foreseeable future. Sustainability reporting regulations will be effective before DPP and not all products or companies will be affected. Nonetheless, companies will have the need to find the necessary data to input into their DPP. In relation to this, the solutions (recommendations) described in this report, will prepare companies for both finding and handling the necessary data to include in the DPP. Companies who adapt and adopt these solutions suggested in the report will therefore be better equipped to meet the requirements of DPP.

8.3 Risk Matrix – Evaluation of Risks to Recommendations

This section evaluates risks related to the proposed recommendations. Each risk was scored from 1 to 5 based on its likelihood and anticipated impact on the project's success and future work. All risks are referred to as "Risk #" and referred to as "R#" in figure 12. Furthermore, as illustrated in figure 12, the risk assessment scores, for all countries included in this project, are represented as: NO/IC = Norway and Iceland, DK = Denmark, FIN = Finland, and SE = Sweden.

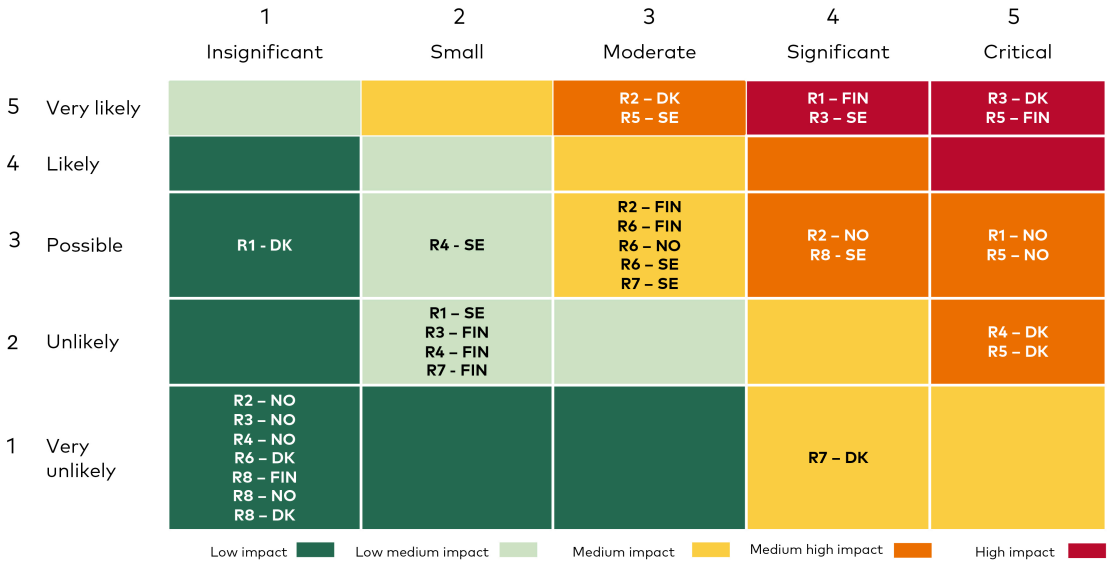

Figure 12: Illustrates the impact of the risk associated with the recommendations made throughout this report

Risks rated with low to low-medium impact should be monitored, but require no immediate action. Risks rated as medium to medium-high impact should be monitored and addressed if necessary. High-impact risks, which could significantly affect the outcomes of this project and objectives, must be considered as important risks to be mitigated. Therefore, the following sub-sections focus exclusively on high-impact risks for each country and general mitigation considerations. The mitigation considerations stem from joint exercises and discussions with all eDocument experts during Workshop 3. Sub-section 8.3.1 adressess risks at a country-specific level due to significant variations in the assessments across countries.

8.3.1 Country specific scoring – top 3 and bottom 3:

The following sections 8.3.1. will outline the scorings considered as the 3 most critical risks assessed by the eDocument experts, on a country-specific level. Detailed country risk assessments are available in appendix 5.

Risk	Finland	Risk	Norway & Iceland	Risks	Sweden	Risks	Denmark
Risk 5	25	Risk 5	15	Risk 3	20	Risk 3	25
Risk 1	20	Risk 1	15	Risk 5	15	Risk 2	15
Risk 6	9	Risk 9	9	Risk 2	12	Risk 5	10
Top 3 Critical Risks							

Tabel 1: Illustrates the top 3 "Critical Risks" identified per country. The numbers are the result of the risk scores (Likelihood x Impact)

8.3.1.1 Top 3 "Critical Risks" Identified per Country:

Finland:
In a Finnish context, Risk 5 *"Non-standardized approaches to calculating emission factors"* and Risk 1 *"Lack of resources to deliver on required information"* were considered high-impact risks, with scores of 25 and 20, respectively. The scoring of Risk 5 suggests that Finland views the non-common or non-standardized approach to calculating emission factors as potentially having critical consequences for climate data reporting. This could lead to difficulties and inaccuracies when comparing emissions internally, across businesses and industries. Regarding Risk 1, Finland believes that making the datapoints mandatory within the eDocuments could disrupt the market, particularly by creating unequal opportunities for companies with limited resources, such as SMEs. General considerations for mitigation strategies of how to address and mitigate these risks can be found in section 8.3.2. Risk 2 *"Limited adoption of eCatalogue"* was considered as a medium-impact risk. This suggests that Finland sees the limited adoption of eCatalogues as a concern but not as an immediate priority. Therefore, this risk should be monitored on a regular basis but only addressed if found necessary.

Sweden:
In a Swedish context, Risk 3 *"Adoption of Peppol and interoperability with non-Peppol systems"* was considered a high-impact risk, with a scoring of 20. This suggest that Sweden considers the utilization and implementation of the Peppol framework across businesses to be a significant risk, as there must likely will be resistance in adopting the Peppol framework from various countries and stakeholders. However, Risk 5 "*Non-standardized approaches to calculating emission factors"* and Risk 2 *"Limited adoption of eCatalogue"* were considered as medium-high-impacts risks, with scores of 15 and 12, respectively. For Risk 5, this indicates that Sweden considers the risk of a non-common or non-standardized approach to calculating emission factors to be less significant and less prioritized compared to Finland's assessment of this specific risk. Indicating that this risk shouldn't be the priority for mitigation in Sweden, but rather monitored closely. Regarding Risk 2, Sweden considers the limited adoption of eCatalogues across countries a potential risk, though not significant enough to warrant immediate action

to ensure the widespread adoption of this eDocument. This assessment aligns closely with Finland's evaluation of Risk 2.

Norway & Iceland:
In the Norwegian and Icelandic contexts, no risks were identified as high-impact risks. However, Risk 5 *"Non-standardized approaches to calculating emission factors"* and Risk 1 *"Lack of resources to deliver on required information"* were both considered to have a medium high impact, each with a score of 15. This suggests that both Norway and Iceland perceive some potential risks regarding a non-standardized approach to calculating emission factors and the adoption of the recommended datapoints in eDocuments, particularly if those datapoints were to become mandatory. As a result, they do not view these risks as requiring immediate mitigation but rather as issues to be monitored and addressed if necessary. Risk 6 *"Futureproofing and scalability"* with a score of 9, indicates that Norway and Iceland view it as a moderate concern regarding Peppol's ability to support ESG reporting needs.

Denmark:
In the Danish context, Risk 3 *"Adoption of Peppol and interoperability with non-Peppol systems"* was considered a high-impact risk, with a score of 25. This scoring suggests that Denmark, similar to Sweden, views the integration with and implementation of the Peppol framework across businesses as critical. It indicates a high likelihood of businesses not adopting the recommended framework in a cross-country context, having severe consequences for data exchange across borders. This may result in inconsistent data formats and impose additional manual work for businesses using different framework and standards. Risk 2 *"Limited adoption of eCatalogue"* and Risk 5 *"Non-standardized approaches to calculating emission factors"* are considered a medium-high-impact risk, with scores of 15 and 10, respectively. For Risk 2, Denmark, like Sweden, sees the adoption of the eCatalogue as a likely but moderately impactful risk for market inequality. Additionally, for Risk 5, Denmark considers the risk of a non-standardized approach to calculating emission factors to be unlikely to occur. However, if it does occur, it will have critical consequences for businesses' climate reporting, particularly in terms of losing credibility in the reported CO2e figures. Nonetheless, Risk 2 and Risk 5 should be monitored closely and addressed if necessary.

8.3.1.2 General mitigation considerations

Considering the top three high-impact risks, only three stand out: Risk 1, scored 20 by Finland, Risk 3, scored 20 by Sweden and 25 by Denmark and Risk 5, scored 25 by Finland. These are the risks that require most significant mitigation to succeed with the implementation of the recommendations. Norway and Iceland have not considered any of the identified risks as having a high impact, which indicates a high level of confidence in successfully implementing the recommendations. The differences in the perceived levels of impact can be attributed to varying levels of maturity in digitization, adoption of eDocuments, local regulations and other operational conditions across the Nordic countries. Considering the objective of this report - to reduce administrative burdens related to exchanging and reporting climate data - the high-impact risks should be mitigated to reduce the burdens for SMEs. This should be done not only to ensure the recommendations are implemented effectively but also to avoid placing additional

burdens on companies during the implementation process.

General mitigation considerations:
As part of the workshops, the representatives were tasked with discussing various approaches and considerations to mitigate the identified risks. The input collected can provide general insights and serve as input for detailed mitigation strategies and plans for both national and Nordic levels. In the below, the countries' reflections are summarized.

In general, representatives from the countries should consider continuing the initiated work and elaborate further on the reflections and leverage these to develop mitigation strategies that address risks on a cross-border level. Joint mitigation strategies will enhance the implementation, streamline processes, reduce complexity, and lower costs of the recommendations. The varying risk scores indicate a need for a harmonized Nordic risk assessment framework. A shared Nordic framework would enhance consistency and alignment across the countries. In relation to the high impact risks addressed in this section, the general considerations and high-level suggestions from the groups are:

- To make the adoption of the new datapoints (identified in this initiative) voluntary.
- To take other, open and free standards, into consideration apart from the Peppol Framework.
- To develop a Nordic standard or agree at a Nordic level on which standard/methodology should be utilized to establish a standardized approach for calculating Life Cycle Assessments and Emission Factors.

9. Recommendations and conclusions

The following section includes the recommendations derived from the workshop discussions. Some recommendations are based on analysis prompted by the discussions and where it was deemed that further investigation was needed to clarify a topic. For these recommendations, the project team has drawn on existing, relevant and supplementing research. The section contains a total of 13 recommendations. These have been grouped into 4 overall categories: 1) Leveraging Existing Infrastructure and Frameworks, 2) eDocuments, Standards and Classification, 3) Calculation Methods and Guidelines, and 4) Reliability and Process Management.

Finally, this section includes the identified and recommended next steps for further initiatives that can help alleviate the administrative burdens of reporting on ESG (as a consequence of CSRD).

The following sub-sections outline five categories encompassing 13 recommendations.

9.1 Leveraging Existing Infrastructure and Framework

9.1.1 Existing infrastructure and building blocks:

To address the challenges identified in the AS-IS scenario, it is recommended to leverage existing digital setups, infrastructures, and building blocks, such as the CEF eDelivery infrastructure, for cross-border electronic document (eDocument) exchange (e.g. of eInvoices, eCatalogues, eOrders, eReceipts and Dispatch advice). Additionally, the TO-BE scenario envisions that platforms are supplied with the necessary access points to enable companies to send and receive eDocuments through centralized infrastructures. This approach enables efficient, secure, and reliable sharing of product and climate data for reporting and future data needs.

9.1.2 Organized by public institutions:

In relation to this, it is recommended to leverage (extend) on solututions and platforms managed and hosted by public institutions, but in collaboration with private organizations. The rationale includes:

1. The digital setup will be available to all stakeholders in the market, including SME's who most likely would face barriers in private-led setups, hence public authorities support inclusivity.
2. Public authorities support all types of companies by providing a neutral framework that considers businesses, regardless of size, thereby enhancing trust and reducing biases or conflicts of interest.

The Danish Bookkeeping Act[13] serves as an example of an public solution that could inspire or be expanded to include ESG data. It requires all companies to comply with the Peppol Framework/network and thus provides a strong foundation for adoption without the need to introduce new methods or systems. This makes it evident that the existing digital setup, organized by the Danish Business Authorities, should be utilized.

In contrast, Sweden currently lacks a central eInvoicing solution or platform for (c.f. figure 8). The current digital setup is organized by private service providers who offer services accommodating both the private and public sectors. This is considered an inhibitor to scaled adoption, and therefore it is recommended that Swedish authorities aim to take greater ownership of the processes.

In relation to the reasons listed above, it is recommended to identify the appropriate public authority in each country and define their roles and responsibilities concerning the organization of the relevant digital setup.

9.1.3 Standardization and Interoperability

It is also recommended to leverage established, open, and free standards like the Peppol Framework and data exchange and interoperability frameworks such as CEF eDelivery to help organizations comply with the regulatory requirements introduced by CSRD. Peppol offers a standardized approach to sharing specific datapoints, thereby reducing the need for data conversion and reformatting upon receiving the data and enabling greater automation of current sharing practices. However, standards other than the Peppol Framework should also be considered, to accommodate the current needs and solutions of a broader range of stakeholders.

Utilizing existing setups and frameworks, reduces the costs and complexity of integration and implementation efforts and ensures interoperability and long-term resilliance. In addition, standards can help further accelerate the adoption and implementation in an inexpensive manner.

9.2 eDocuments, Standards and Classification

9.2.1 eDocuments and datapoints

Since eDocuments are the recommended carriers of climate data, adding new fields will help to accomodate and support climate data needs and reduce the administrative burdens of data sharing. In figure 13, the recommended fields to support the reporting needs are outlined. These consist of both existing and new datapoints. The grey boxes indicate datapoint groups, while the blue highlights new datapoints not currently present in eDocuments or the Peppol Framework.

13. The Danish Bookkeeping Act is a regulation launched to regulate fundamental responsibilities for companies' storage and bookkeeping of accounting material. The material stored and recorded often forms the basis for other mandatory duties for companies, such a preparation of the annual financial report etc. (Danish Business Authorities, Bogføringsloven, 2024)

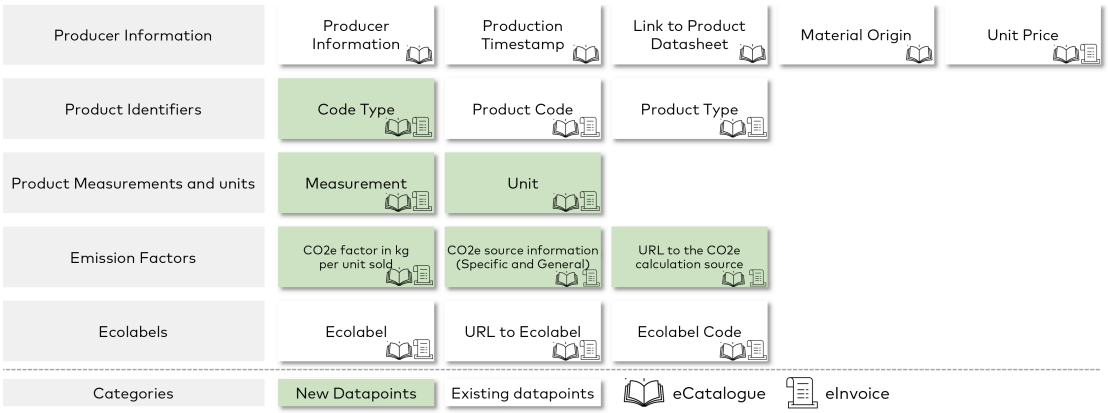

Figure 13: Illustrates all recommended datapoints to be carried out in the eDocuments. Grey boxes are datapoint-groups, while blue boxes are new datapoints

Figure 13 illustrates that the eCatalogue can accommodate more datapoints, including detailed producer information. In contrast, the eInvoice should remain simple, containing only essential datapoints. Figure 13's eCatalogue and eInvoice symbols denote the recommended eDocument type(s) for implementation.

9.2.2 Catalogue as a repository

Businesses should ideally store relevant datapoints in eCatalogues to enable automatic availability in other eDocuments, such as eInvoices. This allows the eCatalogue to serve as a central repository for all datapoints. The eCatalogue should store the most detailed datapoints, while the eInvoice should remain simple (cf. the section "eDocuments and Green data (Mockups)). However, it is essential that all eDocuments, not just eCatalogues, include some or all significant and material datapoints, such as the "CO2e factor per unit sold". Using open and free standards (see section 9.1.3), organizations and even countries can tailor datapoints and values to their needs in each relevant eDocument. This will permit a seamless flow of product and climate data throughout supply chains, supporting the objective of the project.

9.2.3 Classification systems:

To enhance data consistency and usability, adopting the UNSPSC code standard is recommended. Its stable structure supports accurate classification of products across multiple sectors. The UNSPSC code standard allows for easy and seamless addition of new products. Furthermore, it provides a hierarchical classification structure that enhances search functionality and enables data to be structured, categorized, and stored for easy access and retrieval in all systems.

The Nordic countries should consider aligning on the same UNSPSC version. Currently, there are 26 versions, with the latest being UNv26.0801. Denmark has implemented and translated version 19, Norway uses version 18, and Sweden, Finland, and Iceland rely on older versions. To streamline efforts, it is recommended that the Nordic countries collaborate to adopt, translate, and implement the latest version (or at least the same version). Leveraging Artificial Intelligence (AI) might help minimize translation costs

and reduce the time required. This alignment would streamline and improve both climate reporting and general reporting across the Nordic countries.

9.2.4 Linking of UoM to a Product Code list:

To improve product and climate data exchange in eDocuments and simplify processes for suppliers, linking the "Unit of Measurement" datapoint to a product code list like UNSPSC is recommended. This enables the automation of the "Measurement of Units" field for each product. This means that, each time a product has been defined with an UNSPSC code, the field for "Units of Measurement" will automatically be populated. Since "Unit of Measurement" is stable, it simplifies identifying a product's emission factor, to find average emission factors, which can be used with GHG Protocol's average data method.

In this regard, it is recommended to draw inspiration from Norway's successful project of linking UoM to a product code list. This approach can result in significant cost and time savings.

9.2.5 Additional Item Properties (AdditionalItemProperty)

Since approving new datapoints in communities like the Peppol community takes about a year and it is on a cross-country level acceptance, using the "AdditionalItemProperty" group is recommended as a temporary solution. This simplifes implementation while maintaining compatibility with existing standards. Denmark has already integrated the Additional Item Property in both the eInvoice and eCatalogue. It aligns with the **ISO/IEC 19845** standards, which defines the "Universal Business Language" (UBL), which the EU-Norm also is based on, making it possible to facilitate this under the EU-norm. This ensures immediate usability. Furthermore, it should be considered to use the Additional Item Property group for data fields such as the Unit of Measurement, which is typically a fixed value. In Norway, only the fixed value "Kilogram" is used. Additionally, by utilizing the Additional Item Property group for the "Unit of Measurement" data field, it would allow for more flexibility, enabling additional measurement values to be included.

In this context, it is recommended that the other Nordic countries follow Denmark's example by adopting the same structure and approach for implementing the Additional Item Property group. This simplifies emission data sharing for suppliers. It is recommended for the EU commission to implement this approach as well in the EU-norm as soon as possible.

9.3 Reliability and Process Management

9.3.1 Creating guidelines for Updating Datapoints:

It is recommended to guide service providers in how to update datapoints in companies' IT core systems (e.g. ERP-systems), as they need to ensure reliability, availability and security of each datapoint. In addition, this will also help to ensure that the correct datapoints are used for the right purpose.

9.3.2 Creating guidelines for Identifying Dependency Risks:

When updating datapoints, it is further recommended for the service providers to identify if there are any potential risks of dependencies on specific datapoints or systems that could lead to inconsistencies or overwriting of critical information, to ensure data integrity. This is important when considering fields which are automatically populated[14].

The recommendations of guiding service providers in how to update and evaluate datapoints will support the trustworthiness of exchanging and utilizing product and climate data for the recipients and generally throughout the supply chain.

9.4 Calculation Methods and Guidelines

9.4.1 Support of Accurate Calculations:

It is recommended to provide businesses with guidelines on how and when to use similar but distinct datapoints. For instance, if a supplier has both the following datapoints:

- "CO2e factor in kg per unit sold"
- "CO2e factor in kg per base unit".

Guidelines should help the supplier and users prevent errors and ensure accurate "net emissions" calculations in the systems and eDocuments. This should also include necessary guidance on converting datapoints.

9.4.2 Calculation Methods:

Moreover, it is recommended not to include the "calculation methods" datapoint, as no common standard or method exists yet. At the time of this report, there exists several hundred approaches to calculate emission factors or conduct Lifecycle Assessments (LCA). However, it is recommended to further explore the potential value in including the most commonly used methods for LCAs and calculating emission factors, namely Attributional Life Cycle Asssment (ALCA) and Consequencuel Life Cycle Assessment (CLCA). For example, the Product Environmental Footprint (PEF) and Organization Environmental Footprint (OEF) methods could be relevant to consider, as they provide common guidelines for modeling and calculating LCAs and emission factors. It is recommended to establish an on-going system to monitor and assess the maturity and potential of calculation methods deemed appropriate, and when relevant, conduct trials to see if a specific initiative can provide long-term value.

14. An example of a dependency risk: If a supplier changes the "Unit of Measure" for a specific product from kilograms to pieces, this can cause errors between the supplier's and the customer's systems. If the customer's system is configured to interpret the product's UoM as kilograms in an invoice based on previous transactions but then receives an invoice with the UoM updated to pieces, the system may reject the invoice because it cannot map "pieces" to the expected format.

9.4.3 Alignment with standards:

Any guidelines developed to assist businesses in calculating, estimating or collecting datapoints should align with the recommended accounting standards of ESRS and CSRD, such as the GHG protocol. This ensures accuracy, reliability and industry relevance.

9.5 Enabling the recommendations to ease the Administrative Burdens

The 13 recommendations outlined aim to streamline administrative processes for businesses by leveraging international standards and integrating new datapoints into existing documents, datasets, systems, and process flows. Achieving this requires sustained collaboration across the Nordic countries.

What: There is a need for a standardized and digital data exchanged across the Nordic and EU level. This will simplify ESG data collection and sharing, reducing redundancies, and improving efficiencies. Harmonizing processes across borders will also enhance the value of this initiative and create synergies with other digitalization programs.

A strong cross-border Nordic collaboration is recommended to explore how digitalisation and automation can improve sustainability documentation and reporting. The Initial focus should be on climate-related reporting, with the expectation to expand into broader ESG topics.

Initial key areas of focus include:

- Ensuring that any data and digital initiatives are supported by clear guidance for users to understand technical changes (incl. the cross-disciplinary standards) and their impact.
- Supporting the implementation of an international, open, and free standard to enable standardized, secure, and efficient exchange of data relevant to climate reporting.
- Introducing new ESG-related data fields within existing eDocuments in alignment with the GHG Protocol and CSRD requirements.
- Alligning new datafields with recognized open and free standards, such as Peppol, to facilitate interoperability and accellerate the adoption across countries and industries.
- Building upon relevant Nordic, EU, and global initiatives, such as NSG&B, the European strategy for data, Product Environmental Footprint (PEF), and the Digital Product Passport (DPP).
- Strengthening collaboration with standardization bodies and service providers to ensure consitent implementation.

Why: The increasing regulatory requirements for sustainability reporting, have prompted various governmental initiatives to simplify compliance. However, these efforts often operate in isolation, leading to inconsistencies that can increase the reporting burdens on businesses rather than reduce it. Without coordination, companies must navigate multiple reporting frameworks and repeatedly adjust their systems, creating inefficiencies and unnecessary costs.

Coordinated alignment across the Nordic region is essential to prevent redundant efforts and ensure a streamlined approach. Even if all Nordic countries agree on relevant datapoints and electronic documents, differences in adoption timeline and methodologies can create inconsistencies. A harmonized approach will mitigate these risks, ensuring regulatory compliance while reducing administrative complexity.

Who: The Nordic collaboration should contain multiple workstreams with individual, but internally aligned, working groups. The working groups should include representatives from public authorities, businesses across industries, service providers, and NGOs. Generally, there is a need for a cross-functional collaboration which involves:

- Public authorities specializing in areas such as sustainability regulation, digitalization, business policy etc.
- Businesses across industries, representing both upstream and downstream activities, to ensure a comprehensive understanding of value chain requirements - the movement of materials, products, services, etc., in relation to the end customer – to get an overview of existing processes, digital landscape and practices.
- Standardization bodies and key industry initiatives to ensure alignment with best practices and international frameworks.

How: The cross-Nordic collaboration should, as stated, draw on existing groups of specialists and ideally, to the extent possible, be anchored within the existing domains where digitalization and climate responsibilities reside. For this reason, a suggested first step would be to map the relevant stakeholders within the countries, and involve them in the creation of a committed plan to deliver on (or to adjust and deliver on) the above recommendations.

Potential impact: By implementing these recommendations through a coordinated Nordic collaboration, businesses, particularly SME's, will benefit from reduced reporting burdens, improved data quality, and enhanced transparency. A unified approach will also ensure that companies are better prepared for future ESG regulations, minimizing compliance disruptions and administrative overhead. In addition, this will establish a foundation for digital standardization, fostering a more efficient and interconnected sustainability reporting landscape across the Nordic region.

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List of Appendices

Appendix 1 – Reading Guide

Abbreviations	Term Explanation
CSRD	The Corporate Sustainability Reporting Directive (CSRD) is a regulation issued by the European Union that imposes rigorous sustainability reporting requirements on large companies starting in 2024 and 2025, with listed SMEs required to comply by 2027.
ESRS	European Sustainability Reporting Standard (ESRS). A set of 12 standards developed by EFRAG. CSRD requires all companies subject, to use them with the purpose of having a standardized sustainability reporting approach for all companies within the EU. It covers the aspects of environmental, social and governance disclosure requirements and datapoints (EFRAG, ESRS workstreams, 2023).
Peppol Network	Peppol (Pan-European Public Procurement Online) is an enabler business processes by standardizing structure of data / information and how it is exchanged. This allows any business to make trades with each other, assuming they are a "Peppol-enabled" business, anywhere in European Economic Union and potentially anywhere in the world. (Peppol Org, ND)
Peppol BIS	Peppol BIS (Business Interoperability Specifications) delivers a set of specification which empower communication of electronic Procurement information through the so called "Peppol Network". The specifications empower all organizations to transfer information electronically, which complies with legal and business processing requirements within the European Union. (Frømyr, Forsberg, Rasmussen, & Lennartsson, 2014)
ESG	Environmental, Social & Governance (ESG). These are the areas the companies subject to CSRD are required to report on. The purpose of the ESG is to create a representation of the non-financial opportunities and risks latent to a company's operations. Investors use these metrics to evaluate whether an investment qualifies as "responsible".
LCA	Life Cycle Assessment (LCA) is a method to evaluate the potential environment, climate impact and material/resource use of a product or a service. There exist a variety of system boundaries when it comes to LCA's. The most common are: · Cradle-to-gate: this approach includes the life cycle of a product or service from raw material extraction phase (cradle) to when the product leaves the producer/manufacturing site (gate) · Cradle-to-grave: this approach includes the entire life cycle of a product, from the raw material extraction phase (cradle) to when the product has been disposed of (grave). (World Resources Institute & World Business Council for Sustainable Development, 2011)
PEF	The Product Environmental Footprint (PEF) is a science-based method for assessing environmental impacts. It ensures clarity, quantifiability, and consistency within Life Cycle Assessment method. (European Commission, Environmental Footprint Methods, ND)
GHG	Greenhouse Gas (GHG). The greenhouse gas effect is a natural process for earth to heat itself. So, greenhouse gases refer to the gases emitted from earths' natural processes and human-made activities that imprison heat in the atmosphere, due to the heat from the sun. Greenhouse gases literally function as a sponge for sun radiation.

CO2e	Carbon Dioxide equivalent (CO2e), is a unit of measurement used to compare the impact of greenhouse gases.
EFRAG	European Financial Reporting Advisory Group is a private institution established in 2001 mandated by the EU commission. It is responsible of developing and maintaining the public interest of financial and sustainability reporting. (EFRAG, ND)
eDocuments	Electronic Documents (eDocuments) refers to different digital and exchangeable eletronic documents. These documents are as following: eInvoice, eCatalogue, Orders, Order Response/Confirmations, eReceipt and Despatch Advice.
eCatalogue	Refers to an electronic document containing a broad pile of information on a product(s), provided by a supplier. It is typically used to inform the customer about the specifications of the product and used by the customer before the order takes place.
eInvoice	Refers to an electronic invoice that can be sent to a customer based on e.g. the OIOUBL or Peppol standard, through a system that ensures the invoice is delivered in the correct format to the customer. The eInvoice is the ask of payment from the supplier to the customer. The document itself contains information about the product or service provided, payment due date, the payment amount and payment terms. (Erhvervsstyrelsen, ND)
Despatch advice	Refers to an electronic document which is sent from a supplier to a buyer, that contains information about: a description of the product, the quantity of products there will be shipped and the type of product. Further, the document can include information/ a declaration on how the product(s) is delivered and packed, and when the product(s) is expected to be delivered. (OpenPeppol, ND)
EU	European Union
eFTI	Electronic Freight Transport Information (eFTI), is a regulation issued by EU which purpose is reduce administrative burdens. Also, it allows freight transport information to be shared in an electronic format (European Commision, ND).
GHG Protocol	A widely recognized framework/standard for measuring and managing greenhouse gas emissions It is mainly recognized for the following standards: · **Corporate standard -** which helps companies with Greenhouse gas emission inventory, accounting and reporting. · **Corporate Value Chain (Scope 3) Standard** – which helps companies to assess their supply chains GHG emissions (outside the reporting companies' control) to identify which activities pollutes the most. **In total there are 7 standards, which among other things also aim to aid companies and cities in managing, accounting and mitigate CO2e emission in projects, products, procurement etc. (WRI & WBCSD, Standards and Guidance, ND)**
Upstream activities	Refers to the processes that happens in the early stages of a products life cycle, before it enters the undertaking's supply-chain. (World Resources Institute & World Business Council for Sustainable Development, 2011)
Downstream activities	Refers to the processes that occurs after the undertaking has sold a product. (World Resources Institute & World Business Council for Sustainable Development, 2011)
Scope 1	Direct emissions from owned or controlled sources. (WRI & WBCSD, 2004)
Scope 2	Indirect emissions from purchased electricity, steam, heating, and cooling (upstream activities) (WRI & WBCSD, 2004)

Scope 3	All other indirect emissions that occur in a company's value chain – outside a company's ownership or control divided into both upstream and downstream activities. (WRI & WBCSD, 2004)
iXBRL	Inline eXtensible Business Reporting Language is an open technical standard to digitize business information into structured and machine-readable information (XBRL, ND)
UNSPSC	United Nations Standard Products and Services Code is a global classification system used to classify product and services in eDocuments or e-trade. It is a 8 digit code, which consists of 4-level hierarchy referring the proper segment, family, class and commodity. Example: Product: Notebook computer UNSPSC Code: 43211503 **Segment name:** Information technology Broadcasting and Telecommunications (43) **Family name:** Computer equipment and Accessories (21) **Class Name:** Computers (15) **Commodity Name:** Notebook computers (03) (U.S.A. Government Open Data, 2025)
Ecodesign	A regulation that aims to improve e.g. energy performance and circularity when producing, using and disposing products. (European Union, 2024)
Datapoints	Datapoints refers to a unit of information. Datapoints can both be narrative (text or words) or a number describing a specific object. Datapoints should always be unique, free from biases, easy to understand and use.
Data	Data reflects one or more values which represent a concept or object. Values can both be text/narrative or numbers. Data is collected to be investigated, considered and used to help decision making.
Reasonable assurance	Refers to a type of assurance which is used in financial statements, where auditors perform comprehensive procedures, in terms of multiple reviews of data and statements. Test of data is also performed to determine if the statements have been constructed correctly. (Shannon, 2024)
Wholesale company	A wholesale company refers to a business who buys larger batches of raw materials, producers, or distributors, and resells them (B2B).

Appendix 2 – List of Participants

#	Name of participant	Organization	Expert Area	Country
1	Pirjo Ilola	State Treasury	Real time economy, e-Invoice, Payment systems, Standardization	Finland
2	Pasi Sinervo	Tax Administration	Developer	Finland
3	Ossi Paanala	Patent and Registration Office / Business register	Sustainability Reporting Specialist, Financial Analyst	Finland
4	Anderz Petersson	DIGG – Agency for Digital Government	E-commerce Specialist, Peppol BIS	Sweden
5	Thomas Flank	Bolagsverket – Swedish Companies Registration Office	Business Development Specialist, Supply Chain specialist	Sweden
6	Bo Lagerqvist	Bolagsverket - Swedish Companies Registration Office	Attorney	Sweden
7	Thomas Holmgren	Bolagsverket - Swedish Companies Registration Office	IT and XBRL specialist	Sweden
8	Andreas Lennmalm	Statistikmyndigheten - SCB	Statistics advisor	Sweden
9	Jan Mærøe	DFØ – The Norwegian Agency for Public and Financial Management	Digitalization, standardization and process specialist	Norway
10	Petter Vinje	DFØ – The Norwegian Agency for Public and Financial Management	N/A	Norway
11	Bergbór Skúlason	Fjársylslan – Financial Management Authority	N/A	Iceland

12	Anette Friis	The Danish Tax Agency	Development, facilitation of ideas, people, and networks, program/project management, process facilitation, and implementation competencies	Denmark
13	Mikkel Staksen	The Danish Tax Agency	N/A	Denmark
14	Ole Ellerbæk Madsen	Erhvervsstyrelsen – Danish Business Authority	N/A	Denmark
15	Rasmus Rhode	Erhvervsstyrelsen – Danish Business Authority	N/A	Denmark
16	David Meyrowitsch	Erhvervsstyrelsen – Danish Business Authority	Special consultant / Project manager – Environmental Politics, Environmental Science, CSRD, DPP	Denmark
17	Maria Mellander	Erhvervsstyrelsen – Danish Business Authority	N/A	Denmark
18	Jakob Solmunde	Erhvervsstyrelsen – Danish Business Authority	Office Chief -	Denmark
19	Anders Bomholdt	Erhvervsstyrelsen – Danish Business Authority	Chief Consultant – Digitalization and automation of ESG data, DPP, Circular Economy	Denmark
20	Markus Bjerre	Erhvervsstyrelsen – Danish Business Authority	Chief Consultant – Sustainability Subject Matter Expert.	Denmark
21	Jonas Bai	CGI – IT and Business consulting services	ESG Business Analyst	Denmark
22	Henric Berner	CGI – IT and Business consulting services	ESG Data Consultant	Denmark
23	Carsten Brøns Andersen	CGI – IT and Business consulting services	Subject Matter Expert – ESG and Digital process expert	Denmark

Appendix 3 – Datapoints in relation to standards

Relevance		Datapoint Name	Definition	Peppol Identifi	Standa	Comment/Clarifications	Value in relation to CSRD-reporting	CSRD
Peppol	e	Product picture	Product Image			Format not clear	Commercial	
Peppol	e	Product name	The name of the product label.	-		Freetext format in Peppol used to great merry Christmas	Commercial	
WS1 DP	e	Production Timestamp	The date on which the item was first produced or created			Provides contextual information and serves as an access point to allow users to retrieve and sort items by production or creation date.	This information can provide an indication regarding the provided emissionfactor. If no emissionfactor is included the production stamp can assist in receiving proper value for that year. The information gives value in reporting of improvemet steps (E1-1 – Transition plan for climate change mitigation)	
Peppol	e	Product Information	Free-form field that can be used to give a text description of the item. A detailed description of the item.	-		This field can also contain links and eco-labels	Commercial	
Peppol	e	Product description	Free-form field that can be used to give a text description of the item. A detailed description of the item.	-		Most likely copy of above		
Peppol	e	SKIID	Unique identifier for the party providing the catalogue	-		Only used in SKI catalogues, most likely other service providers use similar ID	NA	
Peppol	e	Product code type	Name on the classification code used to uniquely identify the product type. More than one classifications can be used	-		Peppol have a std list with which type of codes that can be used. Example values could be; UNSPSC, Tariff code (HS), CPV, UPC, ...	Important so the receiver can identify the standardised product code used. Without, the product type can't be identified properly	
Peppol	e	Product code	unique code that identify the product type based on the standard system selected in product code type.	-		Several codes can be used for same product, both CPV (classification system for public procurement) and HS could as example be by law mandatory information	Important, as it can be used to uniquely identify items/products, which makes it easier to track products troughout the supplychain. Further, product codes can be automatically process by systems and help to automate workflows. Also, by using product codes, it enables enterprises to integrate eDocuments and its information into ERP and CRM systems. Thereby, product codes can be used to carry CO2e footprint and other relevant metrics to CSRD reporting.	
Peppol	e	Product type	descriptive title/name that denotes a more precise class to which a product/item belongs			Using a good structured and standardised stable product code would be recommended (UNSPSC).	With a good identifier of the product type emission factor trustworthiness can be identified, alternative a more reliable general emission factor can be collected. The identifier also provide support when analysing/reporting on different groups of products	
Peppol	e	Product datasheet link	URI reference to external item information or specifications. E.g. web address alt: a unique identifier used to locate a resource on the internet	-		This link was not specific, based on notes captured during discussions we interpretate is as a link to Prod Datasheet	detailed item information provides more reliable emissionfactors but the effort will raise and if every parts origin is missing the figures will still be general	
ESRS E5	e	Product Component	the materials, ingredients, or components that make up a product.			In the high version this datapoint is integrated in a list where also the amount of reused material can be defined for each component	detailed item information provides more reliable emissionfactors but the effort will raise and if every parts origin is missing the figures will still be general	
ESRS E5	n	Product components & Reused %	(b) the materials that are present in the waste (e.g. biomass, metals, non-metallic minerals, plastics, textiles, critical raw materials and rare earths). The rates of recyclable content in products			Definition refer to waste, recommend to rethink of the term in an effort to keeping it simple it's recommended to add the information in a table.	detailed item information provides more reliable emissionfactors but the effort will raise and if every parts origin is missing the figures will still be general. Information regarding reused is today mainly for commersial usage.	ESRS Set 1 (efrag.org)
Peppol	e	Material Origin	A code that identifies the geographical origin of the material.	-		The lists of valid countries are registered with the ISO 3166-1 Maintenance agency, "Codes for the representation of names of countries and their subdivisions". Codes must be according to the alpha-2 representation.	Together with product timestamp the emissionfactor can be more precise, but add complexity to the calculation	
Peppol	e	Producer Article name	The name of the product as given by the producer				Commercial	
Peppol	e	Supplier product ID	An identifier, assigned by the seller, for the item. Associates the item with its identification according to the seller's system.	-		Free text field that ought to be connected to a standard product code	Commercial if not standardised and agreed upon between all parties	
Peppol	e	Supplier product type	An item identifier based on a registered scheme. Associates the item with its identification according to a standard system.	-		Free text field that ought to be connected to a standard product code	Commercial if not standardised and agreed upon between all parties	
Peppol	e	Link to item	URL to where the item can be ordered from	-			Commercial	
All eDoc	nc	Color coating	A pigmented coating which is applied over a primer			This DP is not relevant for green data reporting. Their can be a relation towards hazardous materials. E.g. if a color coating is made with lead paint		

Peppol	ne	Measurement	The product measurement relating to how CO2e is calculated for the product. This normaly follow the same measure as for defining the product.	-		Group identified the parameters; weight and dimension, both are Measurements and have been analysed earlier. conclusion, instead of specifying type of measurement (weight vs dimension) we should use a neutral word including both and add a UoM fields claryfing type/unit Other Peppol measurements Height - The vertical height of the orderable unit. Length - The horizontal measure of the longer site of the orderable unit. Width - The horizontal measure of the shorter side of the orderable unit. Weight - The weight of the orderable unit incuding its packaging. Package Net weight approximately. Package Net weight exact. Package volume.	Without proper measurement and unit for the product emissionfactor would become difficult to get correct	
Peppol	ne	Unit of measure (UoM)	used to indicate the unit in which the product is measured. Relating to Measurement)	-		e.g. Kilo, Square meter, ... Initiatives started to present a recommended unit for which the product CO2e value is calculated. The initiative is working from UNSPSC codes and connect an UoM to each code	Without proper measurement and unit for the product emissionfactor would become difficult to get correct	
Peppol	e	Supplier name	The party that provides the product specified in the catalogue. Use in the absence of or in addition to Party Identifier.	-			Commercial	
Peppol	e	Supplier ID	Unique identifier for the party providing the product. Identifies the legal entity	-			Commercial	
Peppol	e	Producer name	The name of the manufacturer of the item	-			Commercial, can be of value if it provides information of where the product is created (see material origin)	
Peppol	e	Producer Location	A group of terms providing information about the geographical location, address, of the manufacturer. The main address line in a postal address usually the street name and number. An additional address line in a postal address that can be used to give further details supplementing the main line. Common use are secondary house number in a complex or in a building. The common name of the city where the postal address is. The name is written in full rather than as a code.			please also see Material Origin	Provides information of where the product is created, this provides good information relating to thrustworthiness of provided emission factor	
Peppol	e	Agreement ID	reference that uniquely identifies a contract	-		Freetext field but service provider ought to be recommended to use a dropdown field where only possible values are the contracts this supplier have, optional if the catalogue is specified only for one customer it can be grouped better	Price	
Peppol	e	Agreement name	contract name reference	-			Price	
Peppol	e	Amount/Price	The price for the item.The price is given for each orderable unit. (incl or excl VAT)	-			Spend data calculations should be avoided	
Peppol	e	Currency	Mandatory attribute. Example: EUR, DKK etc.					
Peppol	e	VAT currency code	The currency used for VAT accounting and reporting purposes as accepted or required in the country of the Seller.					
Peppol	e	Unit price (incl. VAT)	The amount of an allowance or a charge, with VAT. Must be rounded to maximum 2 decimals			See amount/Price	There are more aspects to this datapont. Firstly, the unit price can be used as a identicator of the CO2e emissions/footprint, as the price can reflect the CO2e emissions associated with the product. As higher prices can reflect a higher quality product that has a long life cycle, more eco-friendly raw materials etc., hence, a lower carbon footprint. Further, unit price can in most situations be used to calculate the CO2e footprint, considering the spend-based method from the GHG Protocol, if no other information is available to the ESG Manager. Lastly, the datapoint Unit price also reflects the disclosure requirement of CSRD E1-1 "Disclosure of transition plan for climate change mitigation" for the datapoint "Disclosure of significant operational expenditures (Opex) and (or) capital expenditures (Capex) required for implementation of action plan" --> The relationship between the unit price and both Opex and Capex helps in tracking the financial impact of sustainability efforts.	

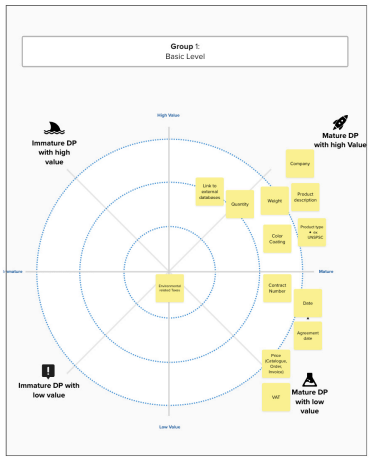
Peppol	e	Unit price (excl. VAT)	The amount of an allowance or a charge, without VAT. Must be rounded to maximum 2 decimals			See amount/Price	There are more aspects to this datapont. Firstly, the unit price can be used as a identicator of the CO2e emissions/footprint, as the price can reflect the CO2e emissions associated with the product. As higher prices can reflect a higher quality product that has a long life cycle, more eco-friendly raw materials etc., hence, a lower carbon footprint. Further, unit price can in most situations be used to calculate the CO2e footprint, considering the spend-based method from the GHG Protocol, if no other information is available to the ESG Manager. Lastly, the datapoint Unit price also reflects the disclosure requirement of CSRD E1-1 "Disclosure of transition plan for climate change mitigation" for the datapoint "Disclosure of significant operational expenditures (Opex) and (or) capital expenditures (Capex) required for implementation of action plan" --> The relationship between the unit price and both Opex and Capex helps in tracking the financial impact of sustainability efforts.	
Peppol	e	VAT rate (%)	The TAX percentage rate that applies to the item unless specific trade reasons apply such as exemptions.	-			Can reflect enviromental or other taxes, if the VAT rate is higher than required by law, in the specific region or country	
Peppol	e	Minimum orderable amount	The increment of orderable units that can be ordered.	-				
Peppol	e	Unit	the measurement method used to indicate the quantity in which the price is calculated.	-		The price could be for 1 pcs but minimun orderable unit is 5 pcs. Price is for 1 package, one kilo ... default value is pcs	CO2e footprint is provided / unit sold. Meaning it is important to have in order to calculate the total CO2e for the invoice line, as the total CO2e needs to be calculated from quantity	
Peppol	ne	Base Quantity	Item price base quantity The number of item units to which the price applies.		Yes	Default value is always 1	Not in scope today, field needs to be reconsidered in case comparing of products become required	
Peppol	e	The number of item units to which the price applies	The number of item units to which the price applies	-		This is a doublett for base quantity, both terms was used by the different groups but correct term is base quantity, this is the descriptive name for the datapoint		
Peppol	e	Number of units in a package	The prepacking the article is available in inside the orderable unit (next lower level packing), and which contains the number of unit described in PackSizeNumeric. Unit desciption to PackQuantity. The value shoud be a valid UOM code like XCS for cas	-		Peppol named and defined: number of packs A unit of count defining the number of packs (pack: a collection of objects packaged together)	need to be considered if product comparison become required	
ESRS E1	n	Materials Used for exise tax	The second type is an internal tax or fee, which is a carbon price charged to a business activity, product line, or other business unit based on its GHG emissions (these internal taxes or fees are similar to intracompany transfer pricing).			Should not be prioritised. Using a method to calculate emission factor from exice or environmental tax paid is to rudimentary		
ESRS E1	n	Environmental Taxes	The second type is an internal tax or fee, which is a carbon price charged to a business activity, product line, or other business unit based on its GHG emissions (these internal taxes or fees are similar to intracompany transfer pricing).			Should not be		ESRS Set 1 (efrag.org)63a - E1-8
Peppol	e	Eco-label	Name information about the items environmental, social, ethical and quality type of labelling			sometimes refered to as "item labelling"		
Peppol	e	Eco-label code	code information about the items environmental, social, ethical and quality type of labelling			sometimes refered to as "item labelling"		
Peppol	e	URL to eco-label	URL reference to external item information or specifications. E.g. web address	-				
1) ESRS E1 2) GHG Protocol 3) Peppol	n	CO2e factor in kg per unit sold	Total CO2e in kg for a sold unit			if a sold unit is 1,5 liter soft drink the given CO2e factor given should represent 1,5 l soft drink	GHG protocol	
1) ESRS E1 2) GHG Protocol 3) Peppol	n	CO2e factor in kg per base unit	Total CO2e in kg for a base unit			if a sold unit is soft drink the given CO2e factor given should represent the CO2e for 1 kg. Initiatives to include the given CO2e factor for a base unit related to the UNSPSC code is discussed		
ESRS E1	n	CO2e Calculation Method	Disclosure of reporting boundaries considered and calculation methods for estimating Scope 3 GHG emissions			Most methods are based upon ALCA or CLCA, but their are no standardised recommended method today why this list will be difficult to maintain/govern		ESRS Set 1 (efrag.org)AR 46 h - E1-6
	n	Cradle to gate (part of CO2e Calculation Method)	a LCA assessment of a partial product life cycle from resource extraction (cradle) to the factory gate (ie, before it is transported to the consumer)			Important if transport data shall be included since this define if you need to add transport for delivery together with who that is responsible for this		
	n	Cradle to grave (part of CO2e Calculation Method)	a LCA assessment for the environmental footprint of your product's full life cycle, from resource extraction to the end of life			Relating to transport data, if customer decide to pick up the delivery himself the CO2e part for that transport need to be recalculated (this will most likely not be done)		
1) GHG Protocol 2) ESRS 2 3) Peppol	n	CO2e Source Information	The source for the CO2e calculation. Can either be set to an product specific source or a general database source. This will indicate if you have done your own CO2e calculation or if you rely on others.			Recommended to keep simple and only define if the CO2e calculation is based upon general figures or created specific for this product 1) When using secondary databases, companies should prefer those that are internationally recognized, provided by national governments, or peer-reviewed. Companies can use the data-quality indicators in section 7.3 of the Scope 3 Standard to select the secondary data sources that are the most complete, reliable, and representative to the company's activities in terms of technology, time, and geography Source	Reliability information	
	n	URL to the CO2e calculation source	Link to the source for the CO2e calculation			With a link to the calculation it's is possible to identify the method used for the calculation.	Reliability information is important in the reporting	

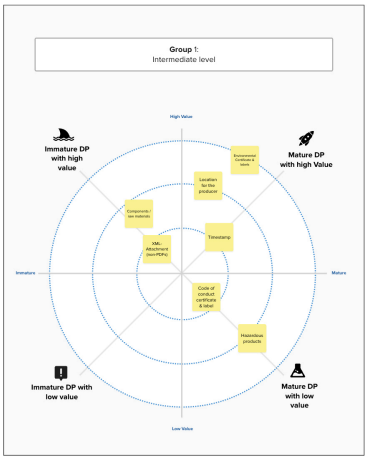
ESRS E5 Peppol	ec	Hazardous Products	The undertaking shall disclose the following information on its total amount of waste from its own operations, in tonnes or kilogrammes: (a) the total amount of waste generated ; (b) the total amount by weight diverted from disposal, with a breakdown between hazardous waste and non-hazardous waste and a breakdown by the following recovery operation types: (c) the amount by weight directed to disposal by waste treatment type and the total amount summing all three types, with a breakdown between hazardous waste and non-hazardous waste. 38. When disclosing the composition of the waste , the undertaking shall specify: (a) the waste streams relevant to its sector or activities (e.g. tailings for the undertaking in the mining sector, electronic waste for the undertaking in the consumer electronics sector, or food waste for the undertaking in the agriculture or in the hospitality sector); and; (b) the materials that are present in the waste (e.g. biomass, metals, non-metallic minerals, plastics, textiles, critical raw materials and rare earths).			Recommend to consider if it's enough to add this as a column in the component table. Description is from ESRS, most of this is not required in the purchase process		
ESRS E5 Peppol	u	Hazardous Products (List)	The undertaking shall disclose the following information on its total amount of waste from its own operations, in tonnes or kilogrammes: (a) the total amount of waste generated ; (b) the total amount by weight diverted from disposal, with a breakdown between hazardous waste and non-hazardous waste and a breakdown by the following recovery operation types: (c) the amount by weight directed to disposal by waste treatment type and the total amount summing all three types, with a breakdown between hazardous waste and non-hazardous waste. 38. When disclosing the composition of the waste , the undertaking shall specify: (a) the waste streams relevant to its sector or activities (e.g. tailings for the undertaking in the mining sector, electronic waste for the undertaking in the consumer electronics sector, or food waste for the undertaking in the agriculture or in the hospitality sector)					
ESRS	nu	Reused material	The percentual value of material that has been reused				Only your part is reported by you	
ESRS E5	nu	Times Recycled	Amount of times reused materials been reused			Recommended to connect to the component table if it's should be included		
ESRS E5	nu	Items Recycled	Amount of items that have been reused			Recommended to connect to the component table if it's should be included		
ESRS E5	nc	Disposal handling	Waste management or waste disposal includes the processes and actions required to manage waste from its inception to its final disposal with a breakdown between hazardous waste and non-hazardous waste.			The waste treatment types to be disclosed are: i. incineration; ii. landfill; and iii. other disposal operations;	Commercial	
Peppol	nu	GPS Coordinates	Always "EPSG:3857" by definition. The X coordinate. Use degrees with decimals. The Y coordinate. Use degrees with decimals.	-		Suggested in WS1, already a possibility in Peppol but not recommended to include for transport CO2e calculation		
Peppol (Belongs to advanced dispatch advise)	nu	Transport type	EURO2, EURO3 etc.			EU is working on new updates for transport regulations eFTI is recommended to follow/use for now		
Peppol	nu	Transport distance	Driving distance in kilometers that has been used for the assignment.			EU is working on new updates for transport regulations eFTI is recommended to follow/use for now		
WS1 DP	nu	Logistics eFTI	The eFTI Regulation is set to transform freight transport within the EU by replacing paper-based documentation with electronic data			EU is working on new updates for transport regulations eFTI is recommended to follow/use for now		
WS1 DP	nu	Transport method	Information regarding whom that are responsible for the transport, seller or consumer			EU is working on new updates for transport regulations eFTI is recommended to follow/use for now		

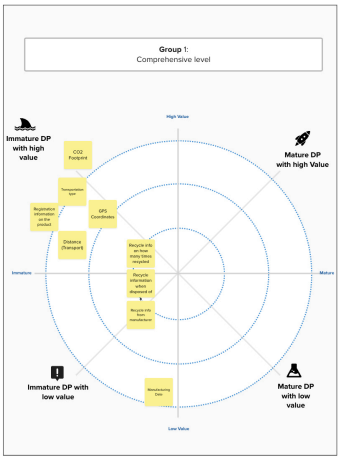
Appendix 4 – Evaluation, Prioritization and Relevance of DP's

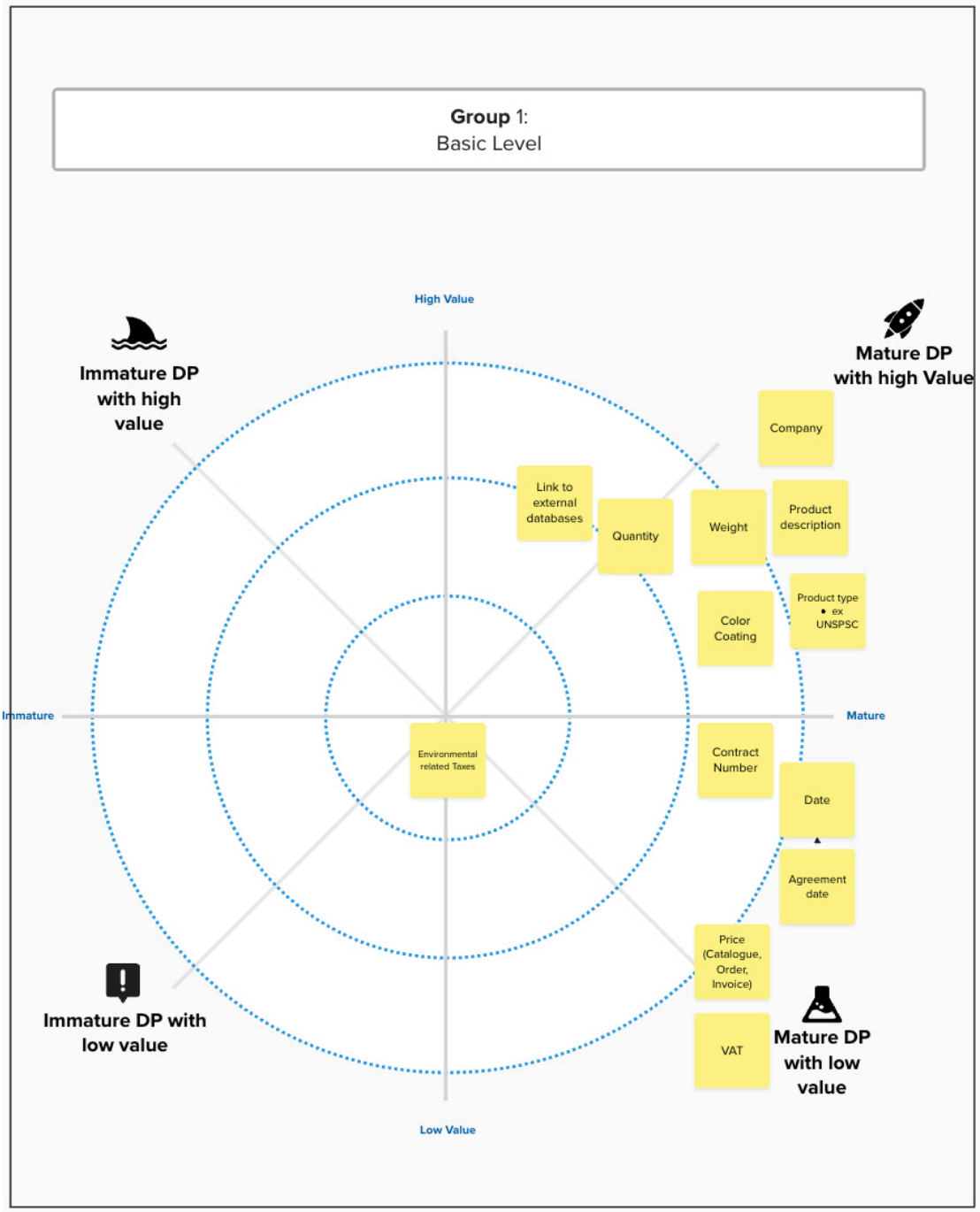
Link to access the evaluation, prioritization and relevance to Datapoints:
Datapoints • jonas.bai@cgi.com

Group 1

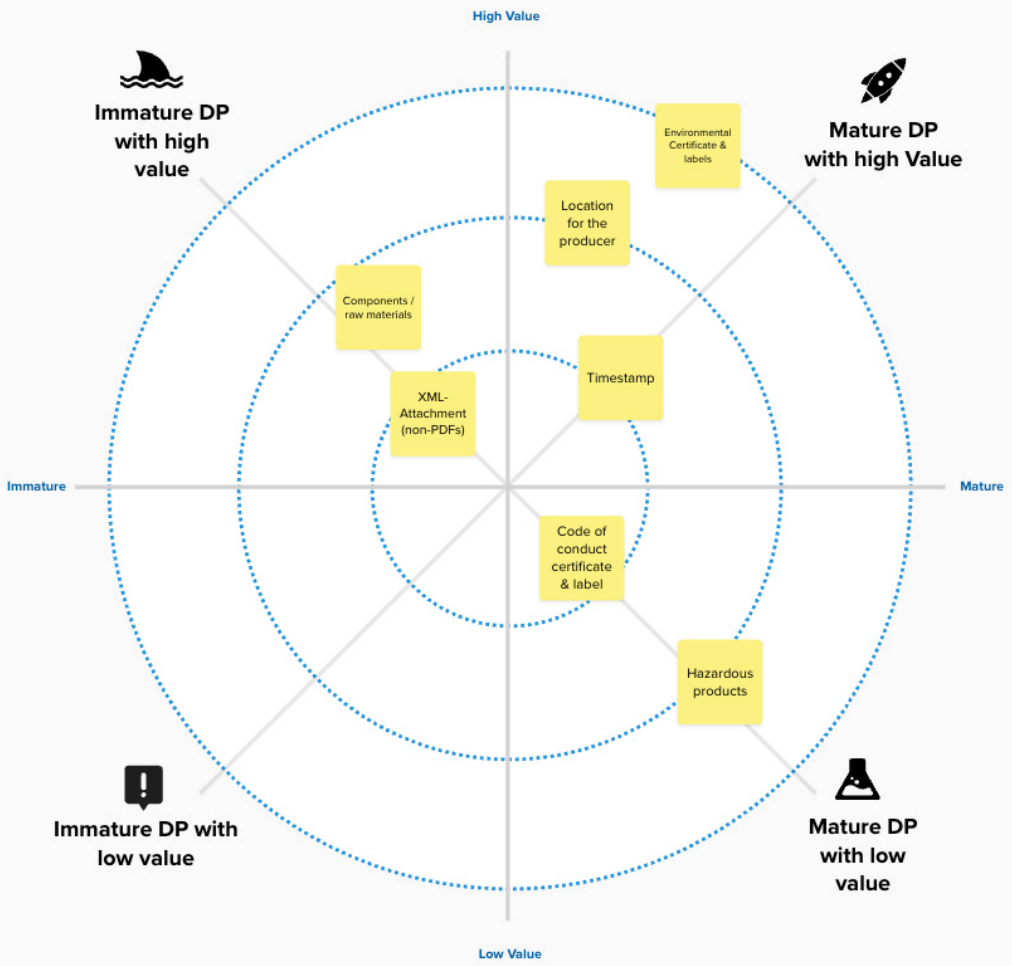




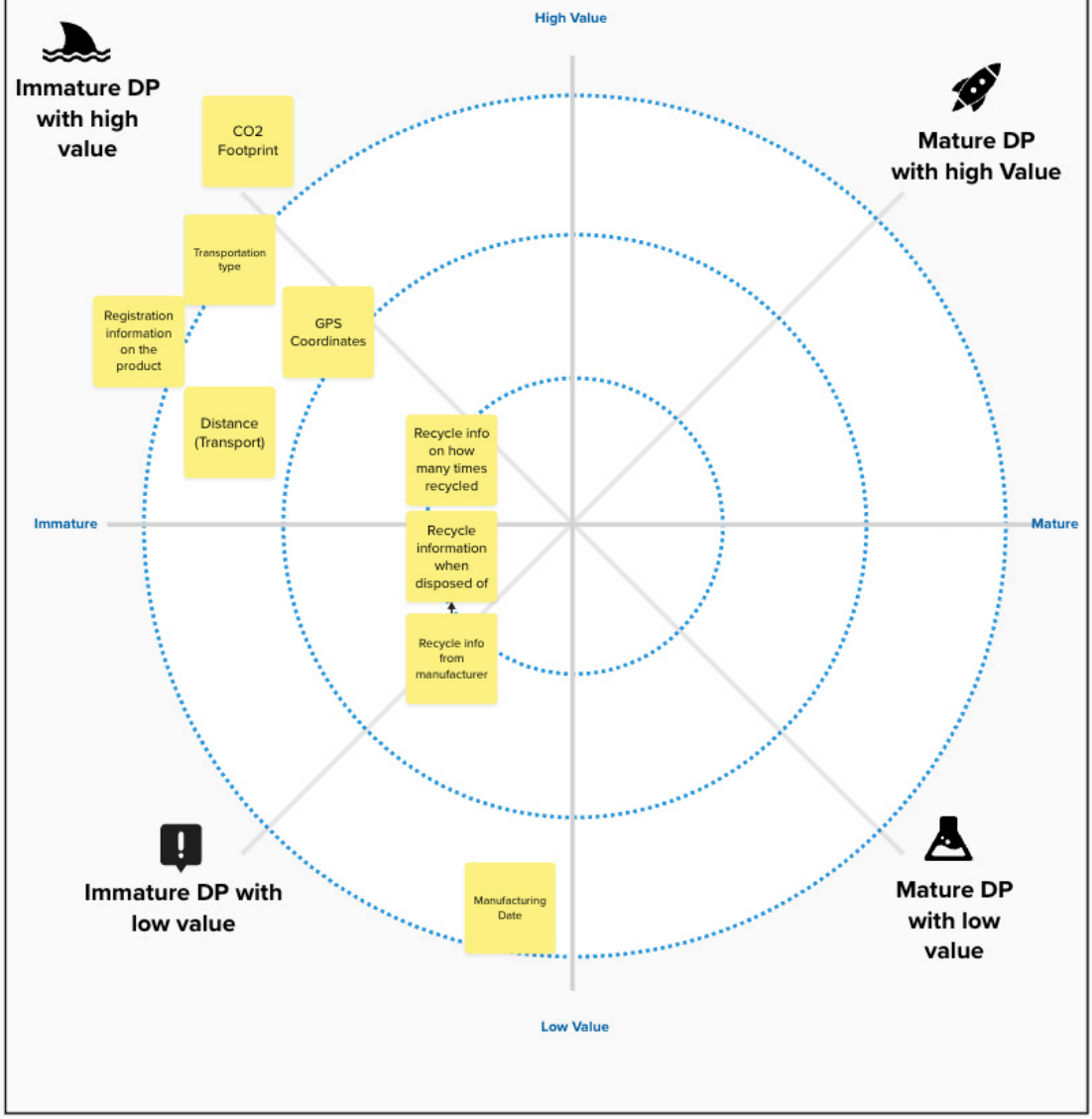



Group 1:
Basic Level
High Value
Immature DP with high value
Mature DP with high Value
Company
Link to external databases
Quantity
Weight
Product description
Product type • ex UNSPSC
Color Coating
Immature
Mature
Environmental related Taxes
Contract Number
Date
Agreement date
Price (Catalogue, Order, Invoice)
VAT
Immature DP with low value
Mature DP with low value
Low Value

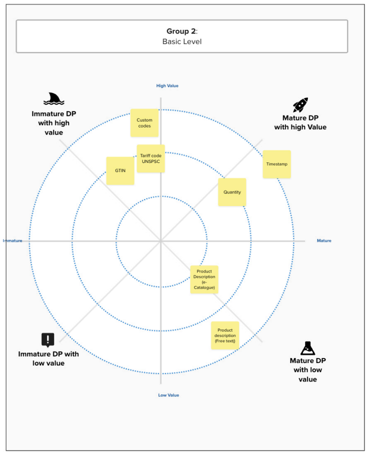
Group 1:
Intermediate level

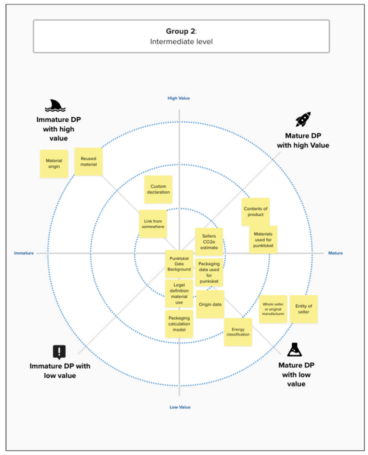


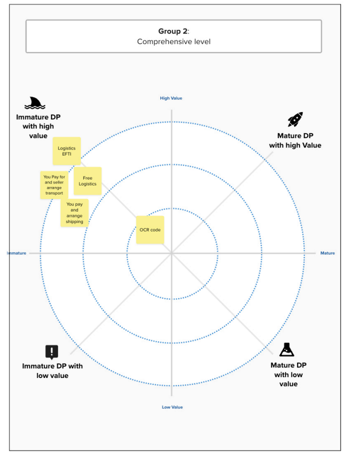
Group 1:
Comprehensive level

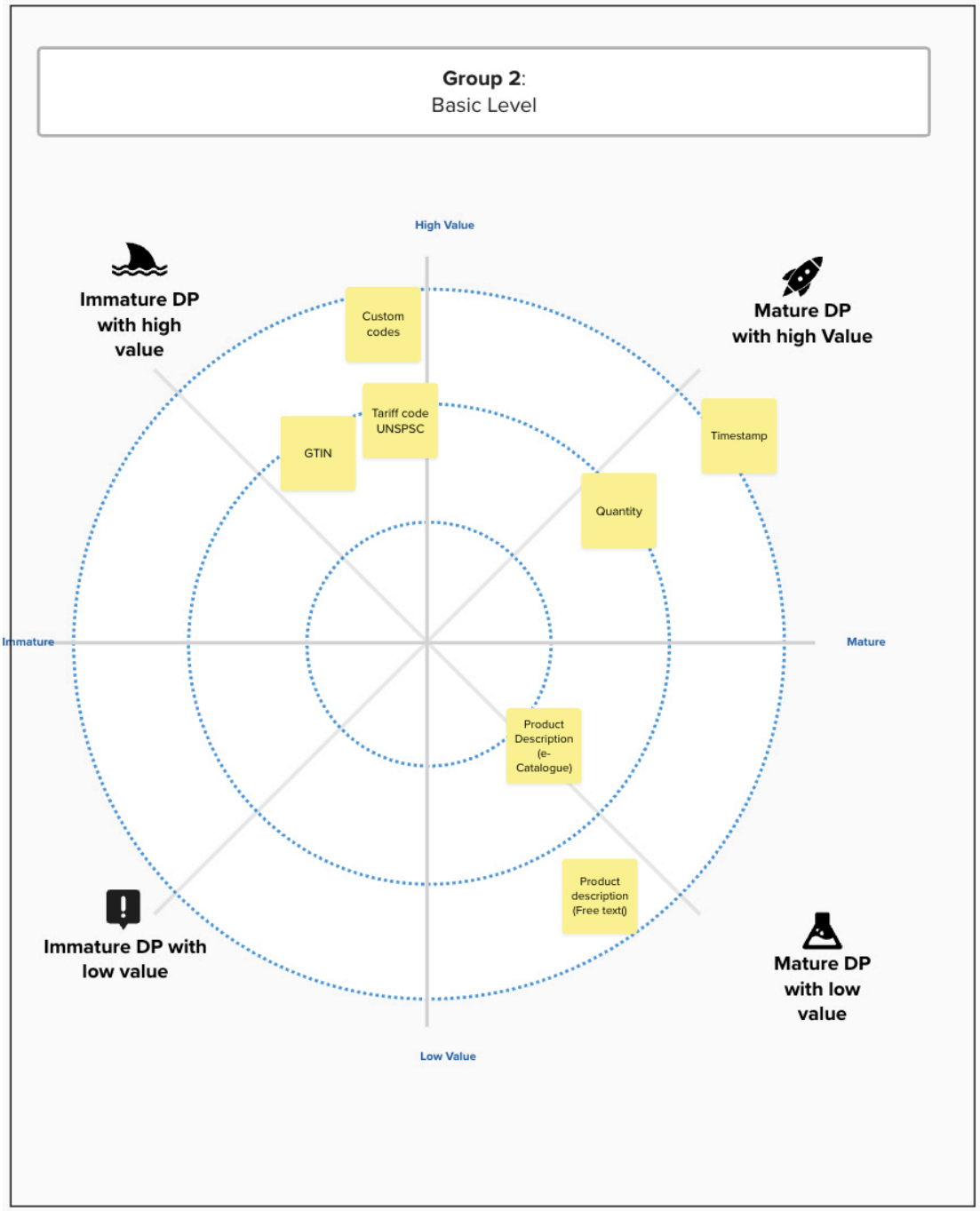


Group 2

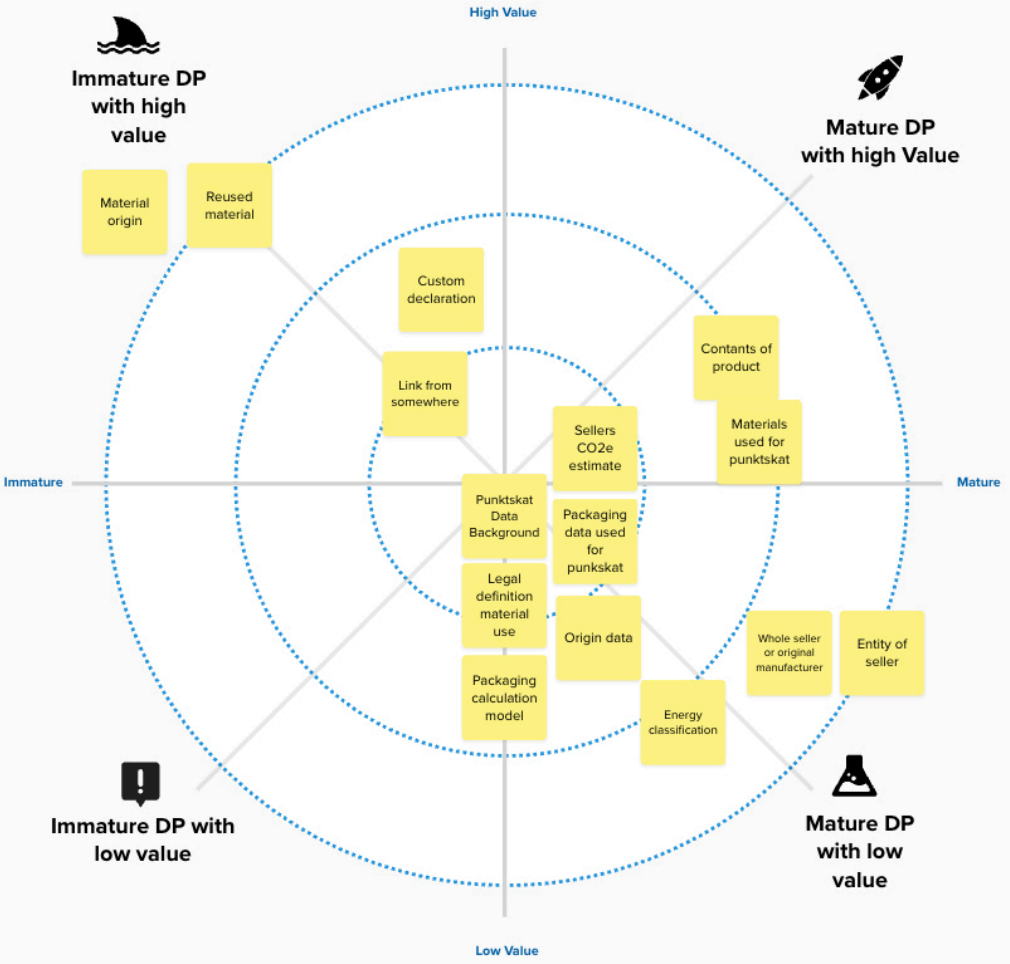

Group 2:
Basic Level
High Value
Immature DP with high value
Mature DP with high Value
Custom codes
Tariff code UNSPSC
GTIN
Timestamp
Quantity
Immature
Mature
Product Description (e-Catalogue)
Product description (Free text()
Immature DP with low value
Mature DP with low value
Low Value

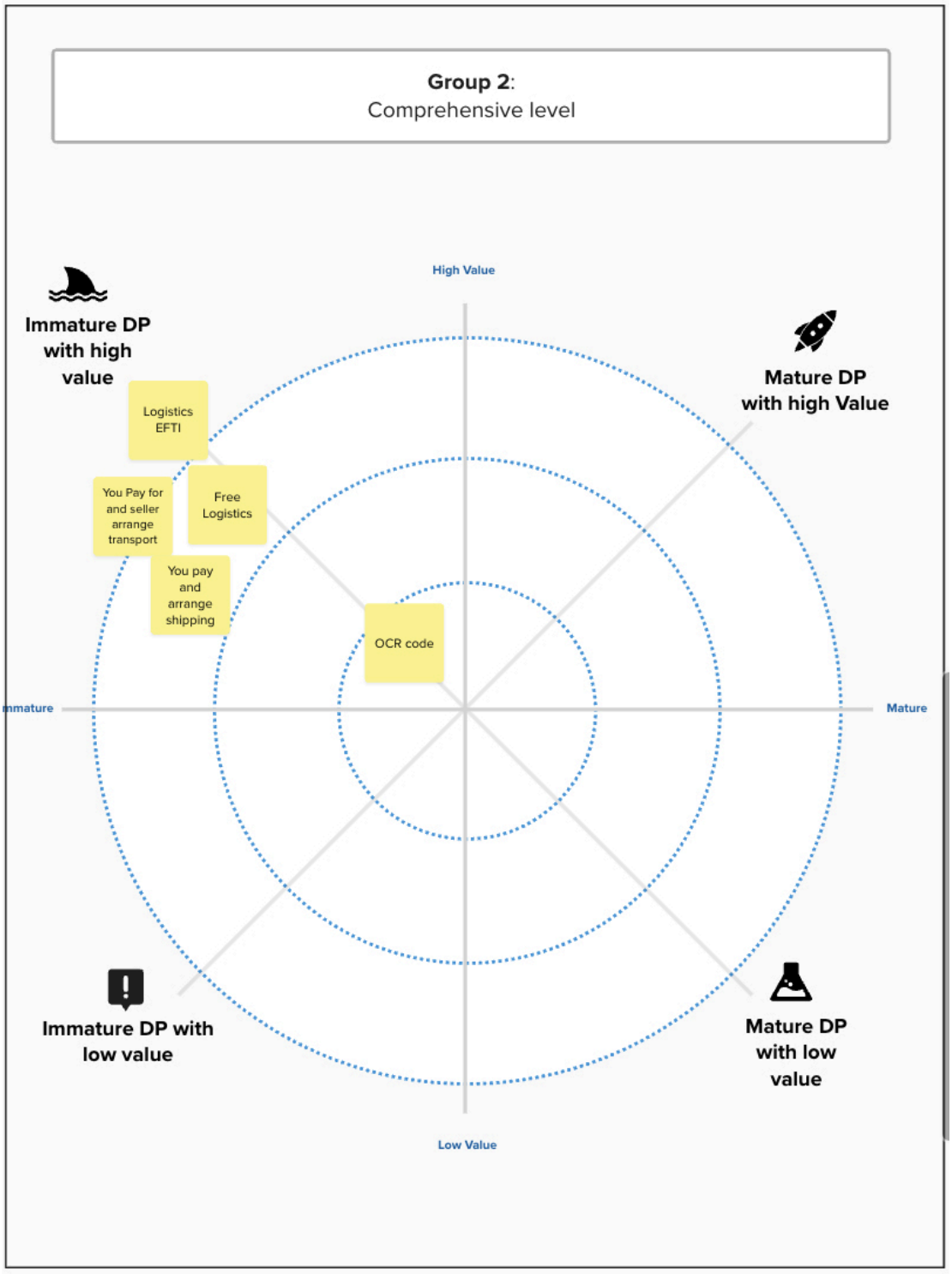

Group 2:
Intermediate level
High Value
Immature DP with high value
Mature DP with high Value
Material origin
Reused material
Custom declaration
Contants of product
Link from somewhere
Sellers CO2e estimate
Materials used for punktskat
Immature
Mature
Punktskat Data Background
Packaging data used for punkskat
Legal definition material use
Origin data
Whole seller or original manufacturer
Entity of seller
Packaging calculation model
Energy classification
Immature DP with low value
Mature DP with low value
Low Value


Group 2:
Comprehensive level
High Value
Immature DP with high value
Mature DP with high Value
Logistics EFTI
You Pay for and seller arrange transport
Free Logistics
You pay and arrange shipping
OCR code
Immature
Mature
Immature DP with low value
Mature DP with low value
Low Value

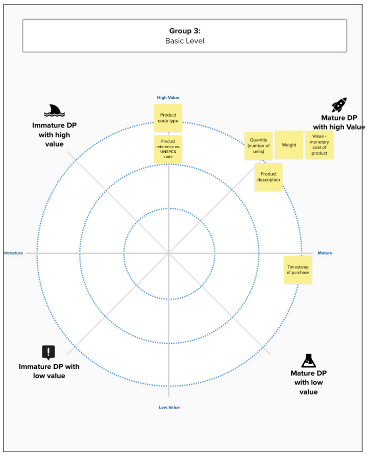

Group 2:
Basic Level
High Value
Immature DP with high value
Mature DP with high Value
Custom codes
Tariff code UNSPSC
GTIN
Timestamp
Quantity
Immature
Mature
Product Description (e-Catalogue)
Product description (Free text)
Immature DP with low value
Mature DP with low value
Low Value

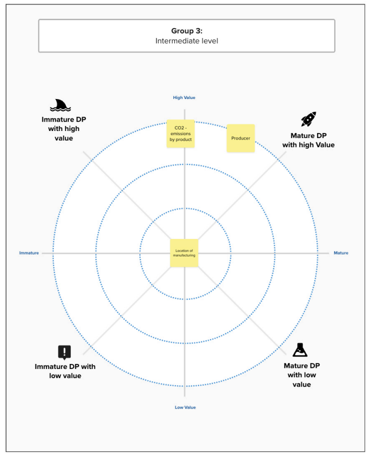
Group 2:
Intermediate level

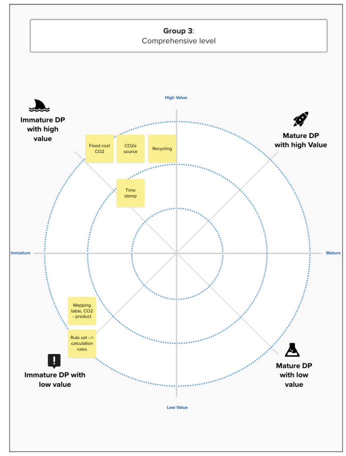


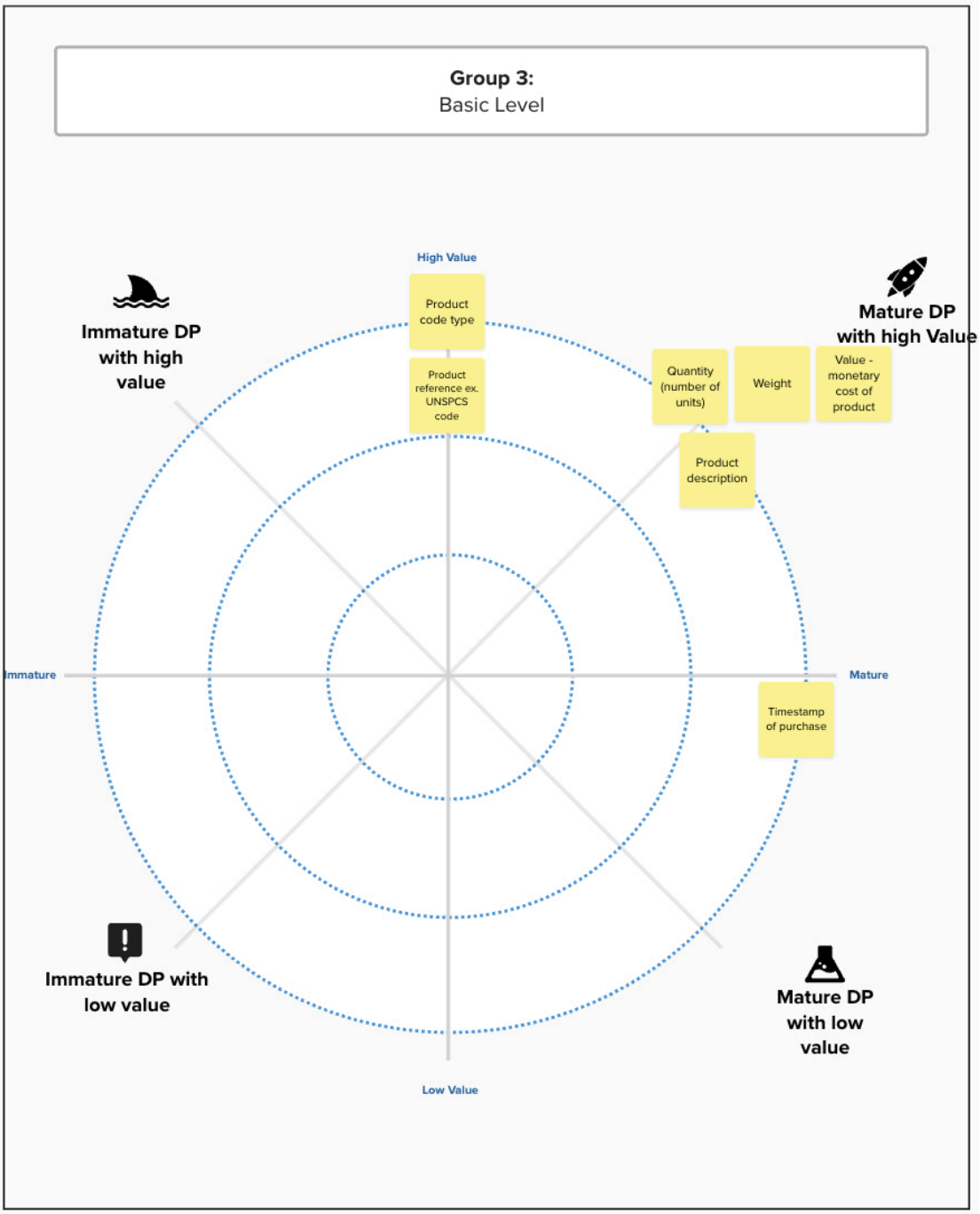

Group 2:
Comprehensive level
High Value
Immature DP with high value
Mature DP with high Value
Logistics EFTI
You Pay for and seller arrange transport
Free Logistics
You pay and arrange shipping
OCR code
mmature
Mature
Immature DP with low value
Mature DP with low value
Low Value

Group 3

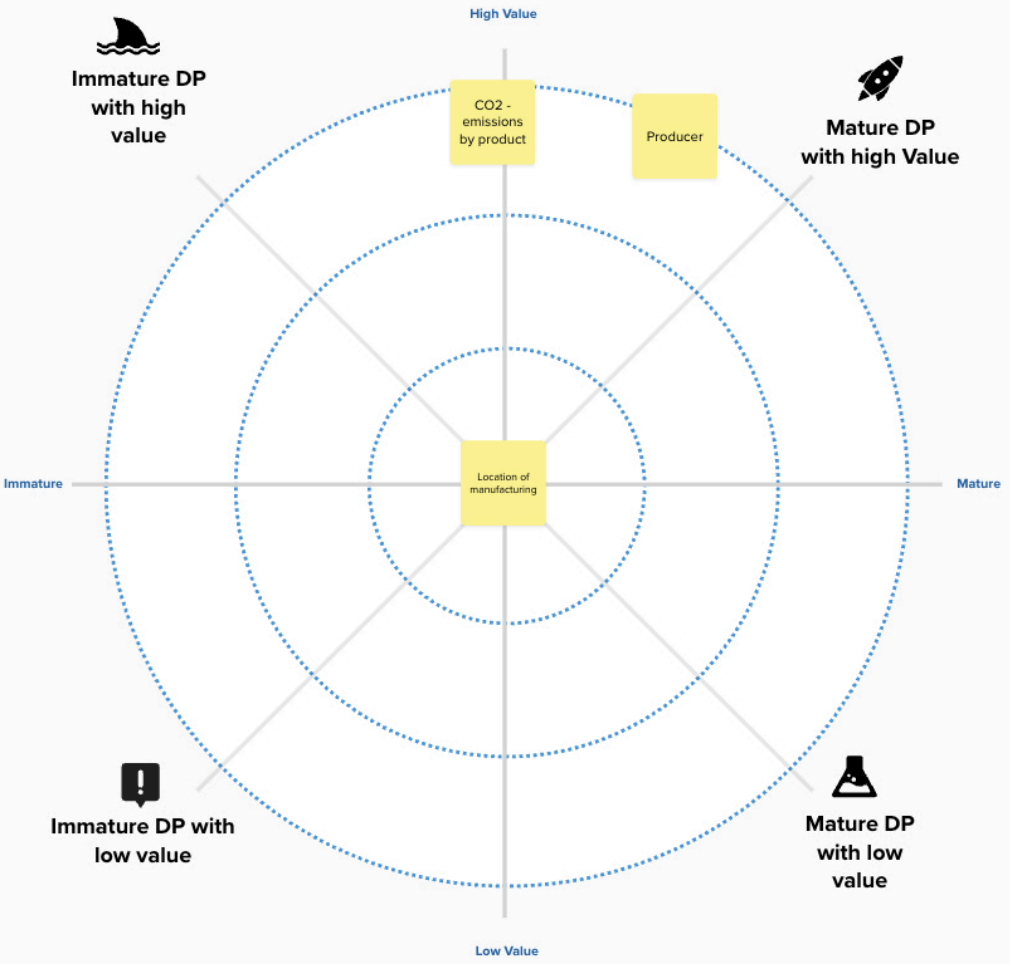

Group 3:
Basic Level
High Value
Product code type
Product reference ex. UNSPCS code
Immature DP with high value
Mature DP with high Value
Quantity (number of units)
Weight
Value - monetary cost of product
Product description
Immature
Mature
Timestamp of purchase
Immature DP with low value
Mature DP with low value
Low Value

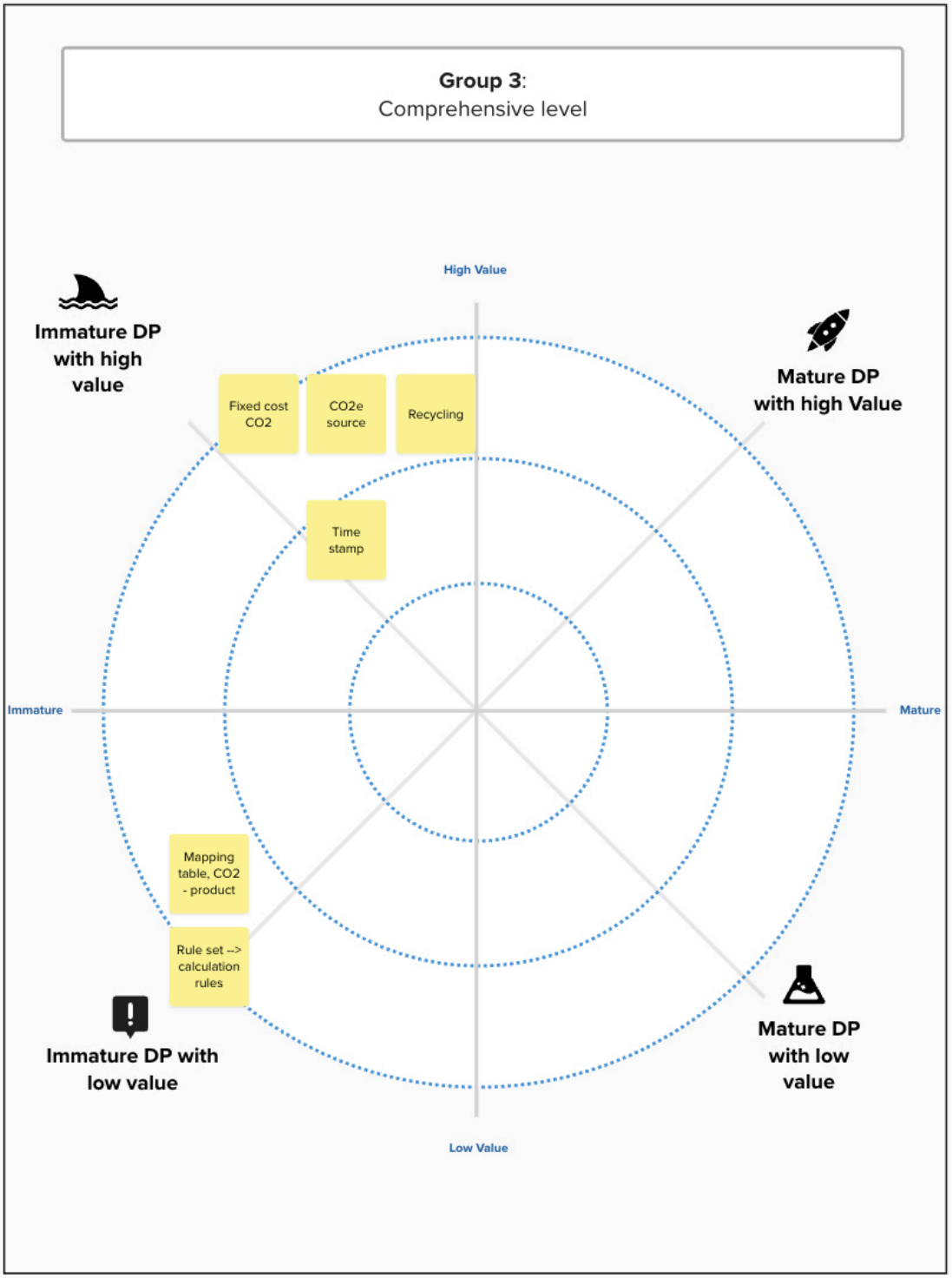

Group 3:
Intermediate level
High Value
Immature DP with high value
CO2 - emissions by product
Producer
Mature DP with high Value
Immature
Location of manufacturing
Mature
Immature DP with low value
Mature DP with low value
Low Value


Group 3:
Comprehensive level
High Value
Immature DP with high value
Mature DP with high Value
Fixed cost CO2
CO2e source
Recycling
Time stamp
Immature
Mature
Mapping table, CO2 - product
Rule set --> calculation rules
Immature DP with low value
Mature DP with low value
Low Value


Group 3:
Basic Level
High Value
Product code type
Product reference ex. UNSPCS code
Quantity (number of units)
Weight
Value - monetary cost of product
Product description
Timestamp of purchase
Immature
Mature
Low Value
Immature DP with high value
Mature DP with high Value
Immature DP with low value
Mature DP with low value

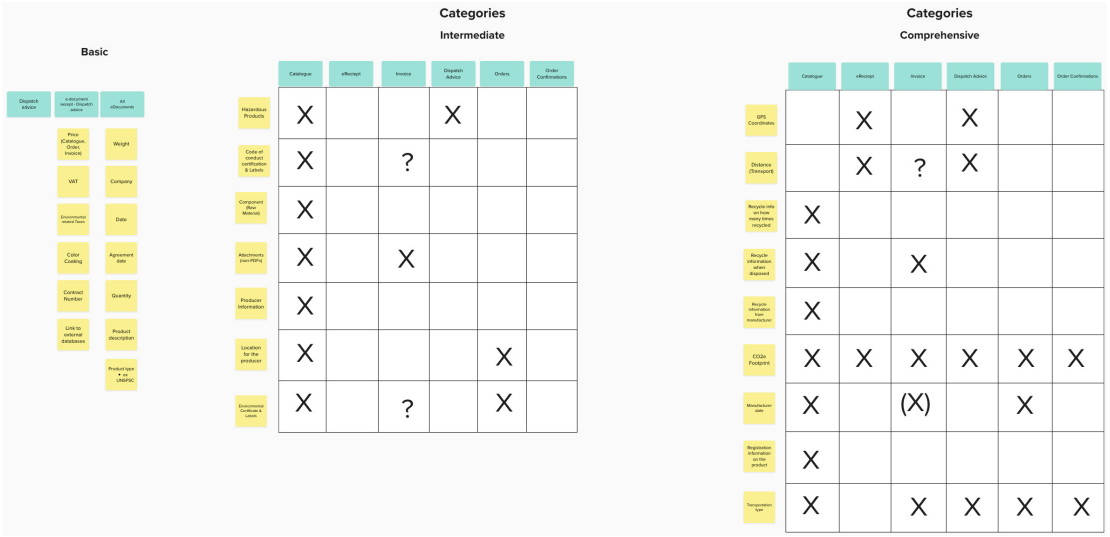
Group 3:
Intermediate level



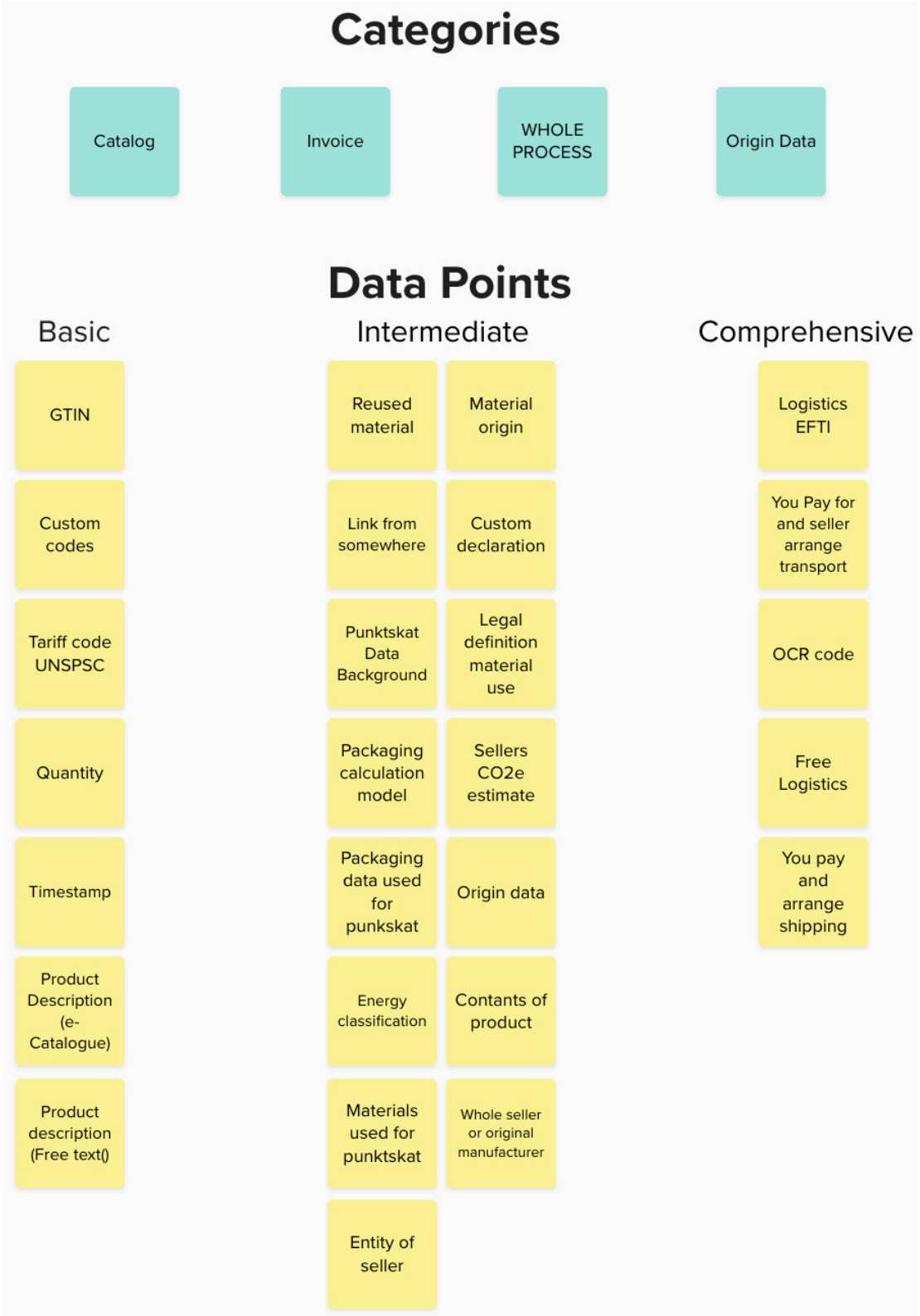

Group 3:
Comprehensive level
High Value
Immature DP with high value
Mature DP with high Value
Fixed cost CO2
CO2e source
Recycling
Time stamp
Immature
Mature
Mapping table, CO2 - product
Rule set --> calculation rules
Immature DP with low value
Mature DP with low value
Low Value

Relevance

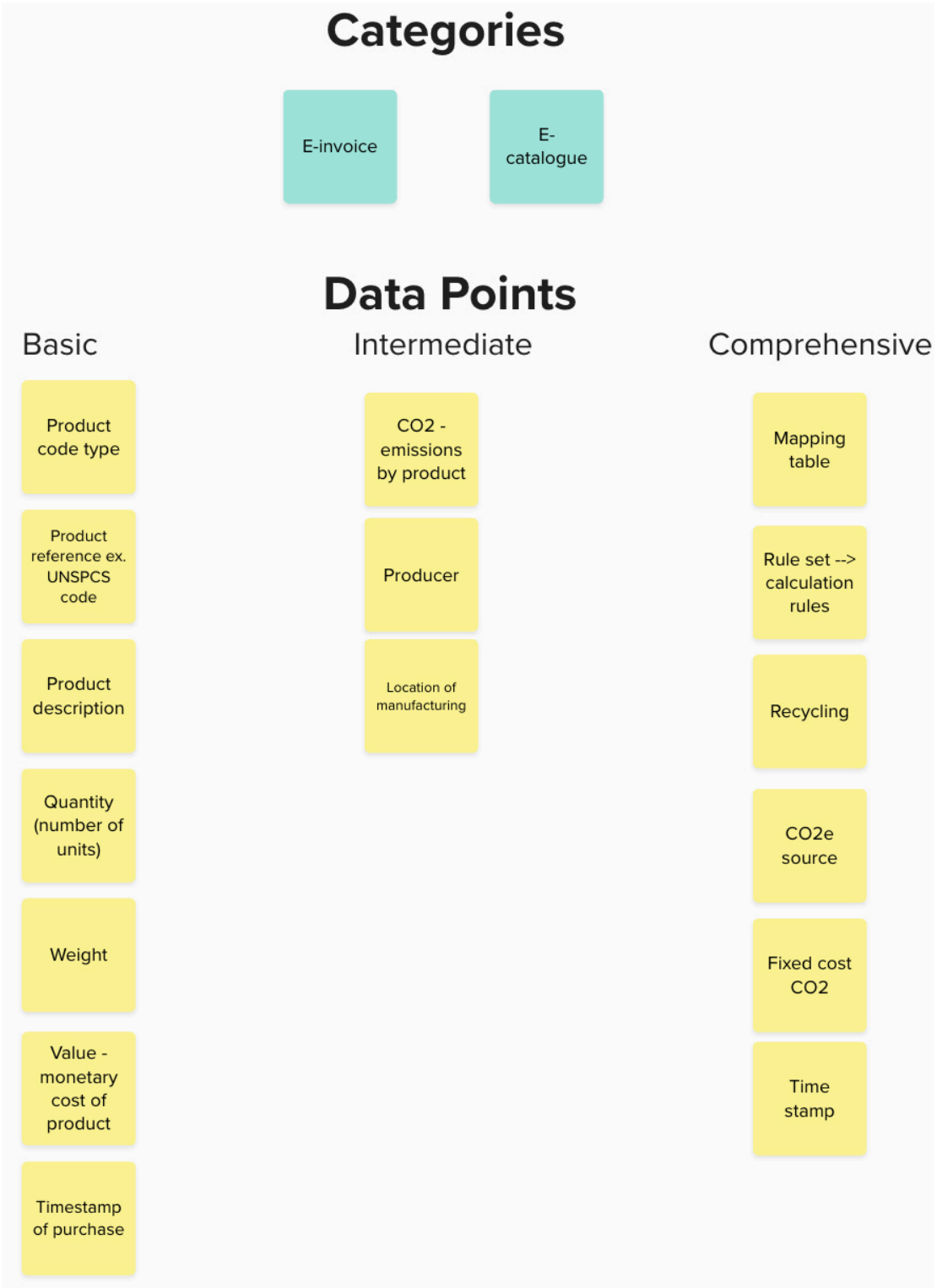
Group 1



Group 2


Categories
Catalog
Invoice
WHOLE PROCESS
Origin Data
Data Points
Basic
GTIN
Custom codes
Tariff code UNSPSC
Quantity
Timestamp
Product Description (e-Catalogue)
Product description (Free text()
Intermediate
Reused material
Material origin
Link from somewhere
Custom declaration
Punktskat Data Background
Legal definition material use
Packaging calculation model
Sellers CO2e estimate
Packaging data used for punkskat
Origin data
Energy classification
Contants of product
Materials used for punktskat
Whole seller or original manufacturer
Entity of seller
Comprehensive
Logistics EFTI
You Pay for and seller arrange transport
OCR code
Free Logistics
You pay and arrange shipping

Group 3


Categories
E-invoice
E-catalogue
Data Points
Basic
Product code type
Product reference ex. UNSPCS code
Product description
Quantity (number of units)
Weight
Value - monetary cost of product
Timestamp of purchase
Intermediate
CO2 - emissions by product
Producer
Location of manufacturing
Comprehensive
Mapping table
Rule set --> calculation rules
Recycling
CO2e source
Fixed cost CO2
Time stamp

Appendix 5 – Risk Assessment's for the individual countries

Finland

Risk Matrix

		1 Insignificant	2 Small	3 Moderate	4 Significant	5 Critical
5	Very likely				Risk 1	Risk 5
4	Likely					
3	Possible			Risk 2 Risk 6 Risk 9		
2	Unlikely		Risk 3 Risk 4 Risk 7			
1	Very unlikely	1				

Norway & Iceland

Risk Matrix

		1 Insignificant	2 Small	3 Moderate	4 Significant	5 Critical
5	Very likely					
4	Likely					
3	Possible			Risk 6		Risk 1 Risk 5
2	Unlikely					
1	Very unlikely	Risk 2 Risk 3 Risk 4 Risk 8				

Risk Matrix

Sweden

		1 Insignificant	2 Small	3 Moderate	4 Significant	5 Critical
5	Very likely			Risk 5	Risk 3	
4	Likely					
3	Possible		Risk 4	Risk 6 Risk 7	Risk 2 Risk 8	
2	Unlikely		Risk 1			
1	Very unlikely					

Risk Matrix

Denmark

		1 Insignificant	2 Small	3 Moderate	4 Significant	5 Critical
5	Very likely			Risk 2		Risk 3
4	Likely					
3	Possible	Risk 1				
2	Unlikely					Risk 4 Risk 5
1	Very unlikely	Risk 6 Risk 8			Risk 7	

About this publication

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The Danish Business Authority: *Rasmus Rohde, Asbjørn Rebsdorf Snæland, David Meyrowitsch, and Maria Kathrine Mellander Mouritzen*

CGI Danmark A/S: *Jonas Bai, Carsten Brøns Andersen, and Henric Berner*

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pub@norden.org

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Nordens Hus
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