

MEMORANDUM

NON-FINANCIAL BUSINESS DATA FOR SMEs IN THE FRAMEWORK OF NORDIC SMART GOVERNMENT (NSG).

Creating value from business data

1. July 2019



**CENTER FOR
CIRKULÆR ØKONOMI**

Preface

This memorandum is prepared by Center for Circular Economy on the order from Business Authorities in Denmark as a part of Nordic Smart Government (NSG) to explore the potential for non-financial business data in the future NSG ecosystem for SMEs in the Nordics

The memorandum gives an overview of future non-financial business data that will meet SMEs and includes perspectives and recommendations for NSG. It must be read as an inspiration for NSG. More detailed analysis and mapping across countries and industries is needed for making specific recommendations and road maps.

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1. INTRODUCTION

Today companies report financial data to authorities for different purposes, as annual reporting, tax and statistics. In many industries the companies must also report non-financial data to document compliance with environmental or food legislation, chemical registers and other. This is an administrative burden for the companies, often involving many manual processes of typing and retyping data into separated digital or manual systems.

At the moment EU-member countries are implementing new legislation to transform to a Circular Economy (CE); as of 2020-2030 the result of six waste directives (Source: 1, 2017) will change the way products, materials and waste is handled in EU with increasing demand for product and material data. Nordic Counsel of Ministers has announced the **“Nordic businesses on climate transition, competitiveness and growth”** (Source: 10, 2018) with the goal to become carbon neutral and show leadership in the Nordic region to benefit from the competitive advantages in a climate transition. This requires a higher transparency and traceability on greenhouse gas (GHG) footprints throughout the value chain of all products. A rise of consumer demands on green economy, transparency and traceability is expected. Companies are an essential driver in the transition to a Green Economy and companies will then be met with substantially increased demands on documentation and handling of non-financial business data. The risk is that companies either succumb to the administrative burden of documentation or will be non-compliant. The risk is expected to be especially high for SMEs that make up the backbone of the Nordic businesses.

The Nordic Smart Government (NSG) project seeks to support the development of an ecosystem of connected digital systems, where data are structured and exchanged with electronic business transaction documents (e.g. eInvoices) creating an unbroken flow. The ecosystem will reduce manual processes in the companies, such as typing and retyping of data in many systems making data more available to businesses and third-party companies developing new digital services. While NSG initially focus on financial data, non-financial data will also be of interest to NSG in the future.

This memorandum contains an outline of the existing demands of documentation of non-financial data companies meet today and what they soon will meet in the transition to a Green Economy. It does not give an overview of which systems SMEs and authorities in the Nordic countries use for reporting and collection of data. The memorandum also outlines perspectives and recommendations of some important elements that need to be developed. Thus, the memorandum serves as the first step in clarifying how the NSG vision can support SMEs in terms of using and reporting on non-financial data.



2. ANALYSIS

This analysis contains a short description of some of data requirements that companies meet today and an introduction to the new requirements of non-financial business data that are coming within the next few years.

2.1. SME Data Requirements today

Today SMEs are required to report financial data to authorities, for:

- Annual Reporting
- Salary and Employee Taxation and Pension Schemes
- TAX and VAT handling
- Depreciations of fixed assets
- And others

Subject to registration of these financial data is mainly purchase and sales invoices; together with employee data. A lot of companies today also handle and report on non-financial data to comply with legislation as for instance when they produce and handle:

- Specific materials; as steel, energy etc.
- Food
- Chemicals
- Waste
- Other environmental hazardous substance

Companies including SMEs also report statistic data, employee master data and payroll data to other public authorities than the Business Authorities where they hand in their annual report. Already today there is a need for minimizing bureaucracy and reporting for SMEs for both financial and non-financial business data. These non-financial business data are often not registered or kept in the ERP-system but are managed in parallel semi-manual systems as excel and then entered into the public digital receiver systems – typically manually or with simple uploads of files. Especially for SMEs there still exists a lot of manual processes related to both financial and non-financial business data for them to comply. Among the very small SMEs some still do not have a digital ERP system – thus very affordable online systems are available.

As an example: In Denmark the non-financial business data are reported to authorities semi-manual as, Environment, Tax, Food authorities and they hold individual systems not necessarily compatible to the ERP systems or to the system that Business Authorities provide.

2.2. Future non-financial business data

In near future resources will become scarce increasing the focus on Circular Economy and demand for transparency and traceability will set new requirements for SME on non-financial business data both due to

legislation and customer demands. Today many countries already have a separate tax on energy – the journey to a Green Economy has started with the need for non-financial business data.

New legislation with requirements to SMEs on the transition to a Circular Economy has been approved by EU bodies and this results in new types of non-financial business data in very near future (2 – 10 years), as:

- EU legislation on Circular Economy is already adopted and is implemented in member countries through the years 2020-2030 with new data requirements on products, materials and waste (Source: 1, 2017).
- GHG emissions on products and companies due to EU Climate Act (Source: 2, 2019) and even stricter local EU Climate Acts as; the new Nordic Climate Declaration with the aim to be carbon neutral and to demonstrate leadership (Source: 3, 2019) for enforcement of the Paris Agreement (Source: 4) will in the years to come set new requirements on GHG footprint on products, materials and services.
- Increasing consumer demands on a Sustainable Global Value Chain requires more transparency, traceability, and data on product footprint as; e.g. biodiversity and environmental & social aspects of production with the UN Sustainable Development Goals (SDG) (source 5, 2016) accelerating this in years to follow.

Real time accessibility to these new data at data capture will soon be crucial for companies to comply with legislation. These data are also important for companies to explore the new business opportunities in the Green Economy. Especially the Nordic companies are globally seen as front runners in new environmental technologies and solutions and therefore the access to real time non-financial business data will benefit this region if an ecosystem as NSG can support the flow of non-financial business data. The data are needed on a timely basis since they are a part of daily business in creating the competitive advantage in the new Green Economy.

Real time, digital data is also important to avoid a large burden that demands for new data will create in companies' daily businesses. Documentation of Circular Products (recyclable), GHG footprints and a sustainable supply chain is necessary for the Green Circular Economy and necessary towards customers.

2.3. Data Requirements on Circular Economy (CE)

A major change that companies are facing is the shift to a CE required from EU legislation already in adopted (Source: 6, 2015) as well as increasing demands from consumers. This creates makes companies to develop new business models to meet the new green market potentials for the European and Nordic SME. Recycling our materials is necessary to be able to withhold a financial sustainable EU – see a brief on Circular Economy in Appendix B. The Circular Economy (CE) will require new types of data, data collections and reporting on non-financial business data, on:

- Product and material content data.
- Chemical content
- Level of recycled material and recyclability
- Data on product maintenance and repair instructions

The overall goal with CE is to retain as much financial value in the materials that we have available within EU since access to new virgin materials is becoming difficult and prices of raw materials increases. This creates new market potentials. The essence is to harvest the values that we today waste or burn for energy production and thereby support the high level of prosperity in EU.

Fundamental elements of CE are in a business perspective is:

- prolonging the lifetime of product
- repairing and maintaining products for reuse instead of waste
- recycling of materials
- design for recyclability and disassembly
- create new clean material streams and material banks as the hobs for recycling

The EU legislation on CE is to a large extend already adopted and it is required for companies to meet this legislation already from 2020 (Source: 1). Practically this means that materials purchased from both recyclers or from virgin sources must include data on the recycling potential and level of recycled material in the purchased volume.

Already in 2015, the European Commission adopted the Action Plan (Source: 6) to boost the EU's transition to a circular economy, promote global competitiveness, support sustainable economic growth and create new jobs. This Action Plan defines 54 measures to "close the loop" in a product's life cycle: from production and consumption to waste management and the secondary raw material market (material banks).

The European Commission also identified five priority areas where the transition to a circular value chain must be accelerated: plastic, food waste, critical raw materials, construction and demolition sector, and biomass and bio-based materials. The Action Plan (Source: 6) attaches great importance to building a solid foundation that promotes investment and innovation. To concretize the reuse and recycling of materials EU approved **6 waste directives** in 2017 (Source: 1) that are now being translated to national laws and implemented in member countries. Some member countries are ahead of legislation in their need for recycling of materials. Lately several countries have banned single-use plastic and EU is banning some groups of single-use plastic as of 2020 since this material is not recyclable and contaminates the recyclable fractions. These new waste directives set requirements to the level of recycled material within the same material types as mentioned in the Action Plan (building materials, packing materials, plastic, textiles, organic fractions). The directives also require new legislation on Producer Responsibilities for products put on the European market. The waste directives also require separate collection of textiles and organic materials from households in near future. Below find a table with an overview of time and fractions required for recycling:

EU Waste Directives (2017)	Now	2020	2023	2025	2030	Status
Separate collection of bio waste			X			Good for biogas retaining nutrients as phosphorus (P)
Recycling of house hold waste				55%		Main part is biological and plastic waste
Producer responsibility of packing material				X		Expected on the product producer not the packing producer.
Recycling of packing material				65%	70%	
Separate collection of textiles				X		Actual recycling is < 10% in Denmark approx. 46 % is collected today. Level of recycling is 55%
Recycling of plastics				X		Some EU countries have already prohibited single-use plastic and EU legislation on this will come in 2020.
Building Waste				(60-70%)		Is a large fraction of the waste handled in EU EU 4 Initiatives to help recycling of building material.
Repair and maintenance of electronics and household machineries	?	?	?	?	?	Some EU countries already have requirements on this
Producer responsibility on electronics (WEEE)	X					Electronics contains scarce metals with increasing prices

The transition to CE is a great business opportunity for many companies and especially for those who can adapt rapidly. Thus, those who are not adopting will struggle to survive. New business models for transformation to a Green Economy will be the main driver for transforming to a new Green and Circular Economy and companies take these challenges very seriously. Even though we experience a lack of knowledge on the basics of CE and the transition potential among business leaders, owners and investors. The transition to CE is the largest business opportunity for SMEs for many years because these companies for many years have suffered from global competition and sourcing of production from Asia. SMEs are typically more agile and innovative than large, cooperate businesses. We also see that entrepreneurs are much greener and more sustainable than the existing businesses and they embed SDGs and Circular Business Models from the birth of their business to an impressive extend. Therefor we expect a disruption wave of the traditional business models due to the transition to CE. Industry 4.0 (digitalization, automatization and sensor technology) will enhance this disruption, since technology mostly is an enabler of sustainable solutions and an enabler of creating data and make them available for consumers (see 3.2.).

From a business perspective the transition to CE requires access to standardized product codes and product catalogs that links to fundamental elements of CE, including:

- material content,
- recycled level of materials
- future recyclability based on design for disassembly and material content
- chemical content to avoid pollution of recycled material streams

It is expected that a standardization of these information connected to a kind of product code or ID will be developed in cooperation with the industries, since they possess knowledge on materials and material flows. To make information standardized and available through a product code or other product ID catalogs will be developed, kept and maintained on regional and national levels. Selected branches have already started the development of product codes as well as design manuals of new material flows for CE. For example, within plastic, steel, food production etc. we already today have product codes that identify content and ensures traceability through the value chain.

Netherlands is a show case for the Circular Economy with the goal of becoming full circular in 2050 and with strong emphasis on the building industry as the industry delivering 50% of all materials (Source: 7). This includes a project to register all standing buildings on a material level to provide recycled and recyclable building materials for the Building Industry with 50% in 2030 and 100% in 2050. Another example is the Plastic Industry in Denmark that has developed guidelines and recommendation for a new circular business model for the whole industry in cooperation with retailers to meet consumers demand on minimizing single-use plastic and recycle more plastic, minimize GHG Emissions and avoid the environmental hazardous situation especially in the marine environment (Source: 8).

We believe that this will happen in all industries and all types of materials within the next 5 years. The new business models and material flows will to a large extent indirectly be enforced by legislation from the EU waste directives (Source 1). A mapping of the existing material data available in various industries is not performed for this memorandum but this would be needed to identify the data gap for industries in an NSG ecosystem.

2.4. Data Requirements in a Green Economy on GHG Emissions

Already now customer and citizen have requirements to GHG emissions from products. In near future it is expected that new legislation will demand requirements on GHG emission on products and this will generate a new set of business data. The Nordic Countries have recently made a common Nordic Climate Declaration to become carbon neutral and demonstrate leadership (Source: 3, 2019). The Nordic Goals (Source: 3+10) will only accelerate further.

In several European countries there is political willingness to introduce local Climate Acts to ensure short term goals (5-10 years) on national GHG emissions; and to comply with the Climate goals set in EU (Source: 6) and the UN-Paris agreement (Source: 4).

Many companies are these years announcing very ambitious Climate Goals for themselves and it seems as if companies are moving faster in their transition to a Green Economy than the political level, with examples stated in the report from Nordic Counsel of Ministers (Source: 10).

This requires transparency in the full value chain of products and services - from production, transport, consumption and disposal using the principles of Life Cycle Analysis' (LCA). A very strong driver in the transformation to a climate neutral society is a GHG label on all products and services visible for consumers and public and private businesses. Several branches have already developed a CO₂ neutral label for their product as e.g.: FSC and the printing industry in Denmark ("klima-neutral tryksag"). Europe and especially the Nordics are amongst the strongest GHG emitters per capita due to, agriculture, transport, energy production from coal and waste (plastic) and not least an extensive overconsumption of products with a strong, negative climate effect, as: meat, textiles, buildings, electronic and others – See Appendix A.

The linear business model of fast consumption and disposal of short life products designed for the business model: "**fast moving consumer goods**" is outspoken in the Nordics especially driven by some of the large international companies, as: H&M, Bestseller, IKEA, JYSK. The products of these providers have a very short lifetime and consumer's awareness is raising on this. We see a consumer movement against the "**fast moving consumer goods**" towards more reuse, vintage and recycling of materials. This is also facilitated by new

online trading and sharing platforms where new providers have easier access to customers than traditionally. The last decade businesses in second hand and vintage in furniture's, clothes and newly also building materials is estimated to have ten folded. Being amongst the large emitters and with global companies providing a criticized business model the Nordics carry a special responsibility in setting global goals on lowering GHG emissions. Enabling the SMEs to be able to display GHG data on their products would give them a strong competitive advantage, supporting their transition and give them access to new export markets – especially within Europe. Including these data through a product code or product ID on eInvoices would enable them to compile faster with future regulations and ease the extra burden of data caption and reporting they will experience due to new sets of non-financial business data. A lot of the issues related to data collection, handling on GHG and reporting overlap with the issues on Circular Economy.

2.5. Data requirements from Sustainable Footprints

Consumers require more and more transparency in the value chain of products and services – not only on CE and GHG but also on other sustainability subjects. Especially the last four decades the production value chains have become global and most of the non-food products purchased today are produced in Asia under troublesome environmental and social conditions. The awareness of this is increasing and becoming essential for especially young consumers and first movers in their choices. Thus, we see increasing legislation on disclosure of sustainability data in company reporting. The last years we have seen reporting requirements towards companies from the International Accounting Standards (IAS), local Company Laws and an increasing number of Stock Exchanges and Institutional Investors requiring sustainability data, as for example; UNGC, GRI, Stock Exchanges (FTSE4GOOD etc.). This is mainly requirements towards the large companies but falling to SMEs as well. A unique capture of data with product codes on eInvoice will enable the SMEs to comply with these future increasing requirements.

When demanding Value Chain Transparency on more types of sustainability data consumers turn towards many Environmental Labels that has developed. Unfortunately, they can be difficult for consumers to decode. Lately consumer have started to request independent Consumer Barometers and more standardized information from retailers, as on:

- Production place and conditions – primary production, mining, manufacturing etc.
- Packing footprint and transport.
- Biodiversity footprint.
- Social data (labor conditions and other local impact including social dumping in EU).
- Health care issues related to Chemicals in the products.

A small example of this was when IRMA (member owned sustainable food retailer under COOP in Denmark) asked their members on sustainability, packing material and future food market in 2016. The outcome here was very clear. Customers wants an independent barometer on product footprint validated by the retailer. IRMA's customers are first movers in food sustainability, quality and innovative products and this trend may well spread among consumers widely.

Today Food Traceability Systems are in place from farm to consumer to ensure food safety and hygiene, so when it comes to transparency in the food value chain in the Nordics these data are already tracked and made traceable but not displayed towards customers. With this the potential for creating an ecosystem that

enables disclosing new non-financial business data on food product are in place. Disposal requires that data are validated and linked to catalogs and standards to make sustainable footprints of GHG, biodiversity, social etc. available for consumer in a credible way. Below find short remarks on the issues related to the mentioned sustainability topics.

Biodiversity

Lack of biodiversity is becoming a treat to many species (fauna and flora) on earth but also to the existence of humans. Latest reports on biodiversity are alarming and btw 60-70 % of insects and other small species of plants and animals are extinct or becoming it within few years (Source: 12). Especially in areas with intensive forestry and food production as in Denmark and the Southern part of Sweden and Finland.

Chemicals

Already today chemical databases exist and are maintained as a result of REACH (Source: 9) and continuously updated with resent research. Producers must compile to the REACH legislation and in future we expect the REACH lists of banned chemicals will increase as researcher identify more and more troublesome chemicals in products. Today it is required that a chemical data sheet is provided (CAS#) with the product if it contained certain classified chemicals.

Sustainable Development Goals (SDG)

An increasing focus on SDG (Source: 5) among companies and consumers due to the attention mentioned earlier on the Global Value Chains. The SDG's are developed as a governance and communication platform and not a roadmap for businesses. Many companies work actively with selected SDGs and companies in the Nordics seem very ambitious in onboarding the SDG. Including non-financial business data in NSG ecosystem can create a link to SDG's.

2.6. SMEs are challenged by new business data

For all the reasons stated above SMEs will meet many new demands for non-financial business data in the transition to a Green and Circular Economy. Compliance with EU legislation on material and product data will become a large challenge for SMEs. The need for simple real time data caption, registration, management and reporting on non-financial business of the large variety of information in the next few years will increase tremendously. Requirements for CE are already legislated and future requirements from Climate Acts together with transparent and traceable sustainability data will challenge the SMEs on administrative burdens.

SMEs are less capable in organizing these data compared to large companies. Without standardized ecosystem for SMEs to rely on several decoupled systems will evolve from system providers and authorities. This will increase the burdens for SMEs and delay the transformation to a Green and Circular Economy. It will challenge compliance from companies, and it will deprive the companies in catching the new business potential available for the Nordic SMEs. Nordic companies are today being frontrunners in the new Green Economy, so a setback due to new non-financial business data will also pass the opportunity for growth and employment of less skilled workers in the Green Circular Economy. Thus, there will be a need for handling,

maintaining and producing more products locally to meet demands for more sustainable and transparent production.

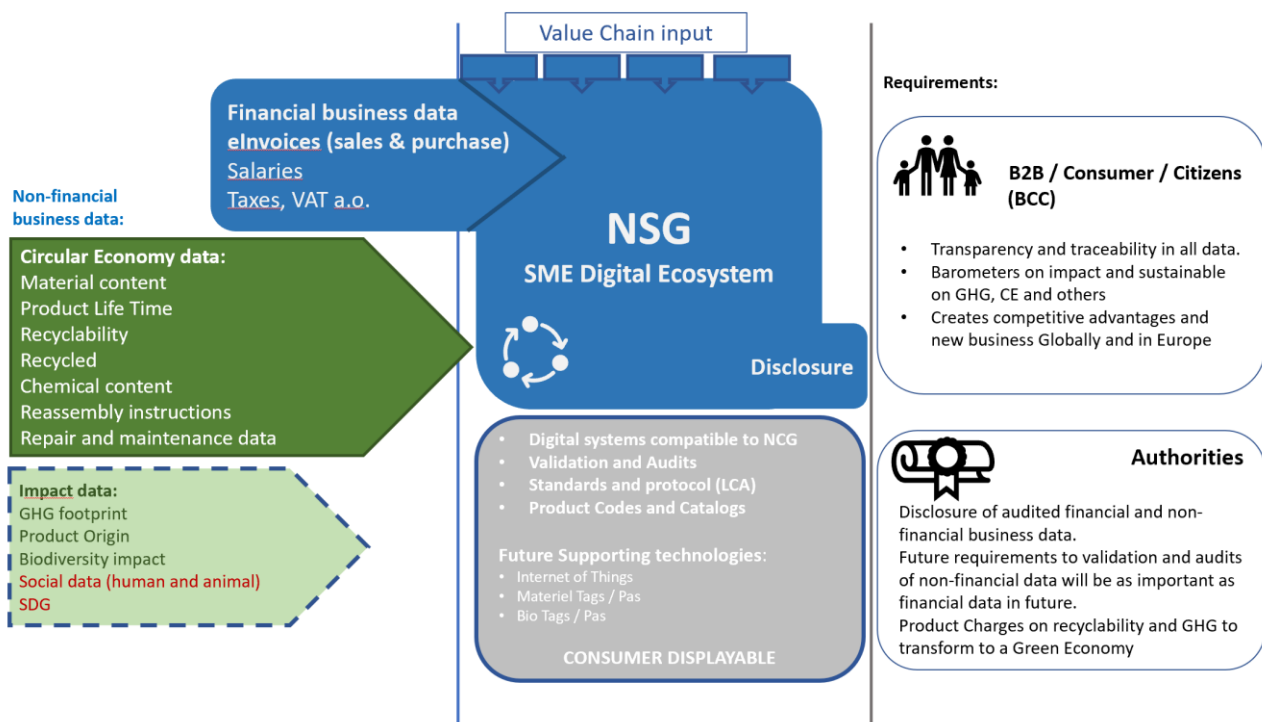
Providing an ecosystem as NSG will free SMEs from a lot of administrative burdens and enable them to a faster transformation to the new Green and Circular Economy. It will also enable them to an easier administration of their own inventory and material handling since many SMEs do not today register their stock and material data when they receive purchase invoices or send sales invoices. Many SMEs hold small subsystems in excel and physical books to manage their product flow through the company and this will only increase with the new requirements. A uniform standardized capture of product and material data (eInvoice) will not only be necessary in a CE but also ease the internal management of the companies.



3. Framework and perspective for SME Future Business Data

The figure below illustrates the NSG ecosystem with underlying guidelines and systems to standardize and compare the non-financial data. On the left side of the illustration are boxes with the future data. Legislation on CE are already adopted (full line), and other impact and sustainability data as GHG data below (dotted lines) are expected in EU within few years. GHG footprints and goals are already occurring on company and national levels.

On the righthand side of the illustration is the requirements set by Business, Consumers and Citizens (BCC) in one box and the requirements from Authorities in the box below. The requirements from BCCs are mainly to increase awareness and transparency as a support to the transformation to a more sustainable world and a Green Economy in their choice of products and services provided by companies. The requirements from authorities is to ensure companies meet legislation on reporting and disclosure in future implementation of especially Circular Economy in Europe, the Paris Agreement on Climate Change and following local Climate Acts.



Business data on sustainability in the NSG ecosystem also enables registration, trading and reporting smarter for SMEs minimizing administration burdens and points of data entry and capture. The capture point of the non-financial business data would naturally be the same as for financial business data on an eInvoice with product codes linked to catalogs.

New ways of handling data and building new business models is already ongoing in a bottom-up approach in various branches. The Plastic Industry has had standard material codes in their product for many years - but it has not been implemented extensively enough to recycle plastic on a regional and global level – hence less

than 10% of all plastic is recycled today. Standardization of product data is soon a necessity in all industries and manual registration and sources of errors will become a large burden. When data capture is unique, uniform and from the same digital source (eInvoice) on a real time basis every time products are traded a lot of manual administration is spared.

3.1. Information and standards needed for non-financial business data

As indicated above in the grey box some basics must be in place to make the material and product data useful for all stakeholders and companies. A lot of this basics are developed now and in near future why it is important for NSG to develop on the existing progress within the topics below:

Standards

To be able to capture, use, report and disclose on transparent and traceable non-financial business data the NSG ecosystem will have to link to standards, audits and technologies to ensure data validation, uniformity and comparability.

The material and impact data from products require standards to be able to create the wanted transparency and comparability amongst products and services. These standards are to provide some basic information:

- The recyclability of materials (upstream).
- Level of recycled content in products (downstream).
- Life Cycle Analysis Methodology (LCA) to assess footprint on select impacts as e.g. GHG.
- International legislation and recommendation on Organic Growth.
- International legislation and recommendation on Social Impacts and Labor Conditions.
- Other.

Product code (ID) and catalogs

The link to this standardization is a product code or ID included on the eInvoices. The translation of the product code goes through catalogs (databases) that are developed, kept and maintained in cooperation between National Authorities and Trade Associations on National/Regional levels based on EU / Nordic regulation and standardizations on product content etc. These already exist for some industries, but it will be required in all industries in future. SMEs do not capture these product data with the financial data today.

As a process for standardizing information EU is now and in future announcing protocols, as for instance LCA-standards on measuring various product impacts as well as new standards for the registration methods of recycled materials. These new registration methods has effect from 2020-2030 (Source: 1) and will create the platform for a transparent and uniform standard on reporting recycling levels of waste as required from National and EU bodies.

These standards, registration and reporting methods are essential for NSG to ensure correct, transparent, traceable and easy registration for SMEs. Additionally, the capture of material and sustainability data together (non-financial business data) with the capture of financial data will lower the administrative burdens for SMEs already today and even more in future with increasing requirements.

3.2. Future Technologies supporting the Green Economy

Industry 4.0 with development of new technologies in digitalization, automatization and sensor technique provides software, IT-protocols, devices and sensor to register and display these data on the products. Below find some of the technologies ready for material, product and behavior tracking that is expected in near future:

- **Internet of Things (IoT):** all our electronic devices will connect to the internet monitoring peoples traffic, movements and behavior to put information, products and services available for citizens and customers at lowest cost and to some extend also a more sustainable consumption of energy, transport, light, indoor climate, information and others.
- **Tags and codes:** Some product types already have chips, tags and codes in them or on their packaging. Displayed as bar codes, QR codes and other. It is expected that all materials and products will carry tags that can be scanned with smart devices (tablets) displaying information on material content, additives, origin and many other information. Experiments are made on tagging textiles and building materials in the preparation for recycling of these materials.
- **Material Passports.** It is expected that all new products in future will carry a passport where all information throughout the value chain are recorded. The development of protocols and standards for this is not yet in place, but the technology is small and inexpensive. Readable passes on product is available.
- **Biological and Genetical recognition.** Already today it is possible to trace biological material through cellular and genetic compounds as for instance done in tracing oil pollution from ships or DNA fingerprints to solve crimes. This has new perspectives since all organic materials in future will be detectable in the same way.

These technologies will rapidly enable the demands and requirements of these new business data and the development of ecosystem to unify the data flow for SMEs will be necessary to support the SME into the Green, Circular Economy.

The above standards, protocols and technologies are not evaluated in this paper but just addressed as important enables already in place and important for a financial data ecosystem to connect to, in the avoidance of developing several disconnected systems and rules for SMEs to comply to. The new technologies are easing the data handling and making it simple and inexpensive for SMEs especially if it has impetus into an overall ecosystem as NSG.



4. PERSPECTIVES AND RECOMMENDATIONS

The goal of NSG is to create value from business data by enabling a digital ecosystem for Nordic SMEs that will minimize administration of financial business data and increase real time data availability for all stakeholders in the ecosystem of SMEs. It has a large value for SMEs if the NSG digital ecosystem also includes non-financial business data that will support them in their transition to a Green Circular Economy. A digital ecosystem that also contains non-financial data on products and producers will ease the coming administrative burdens for SMEs and be an important enabler of Nordic businesses on climate transition, competitiveness and growth, as the Nordic Minister Counsel has ambitioned.

Standards for capturing, handling and reporting of non-financial business data in the NSG ecosystem is often mentioned here since it embeds many of the new needs highlighted even when the underlying information is different. A uniform ecosystem for these non-financial business data could be an overall frame for handling all types of new data generated from all types of new technologies in a way that it creates value for Nordic SMEs.

Most important is it that an NSG ecosystem for non-financial data will accelerate the transition of SMEs to more sustainable products, services and business models enabling a competitive advantage in a market that is rapidly moving into a Green Circular Economy. Companies who do not transform will rarely survive.

Companies already today report on non-financial business data and the amount of these non-financial data will increase in near future due to implementation of the new Green and Circular Economy including the newly set goals on the Nordic carbon neutrality and leadership position. The new Green Circular Economy is based on sustainable and transparent production in a global value chain. The EU Action Plan and Waste Directives for CE have already been adopted and implementation is due from 2020 to 2030. Nordic countries have set ambitious goals for their Climate Change Actions applicable already from 2030 through 2050. Companies are playing a central role in the transformation to the Green Economy.

UN Sustainable Development Goals (SDG) are accelerating the transformation to more sustainable businesses and companies already experience new business opportunities through new Green and Circular Business Models that require new data on products, materials, recyclability etc. The backbone of the Green Economy is reliable and traceable information available to customers and other stakeholders. Access to real time non-financial business data in a simple and transparent way has financial impact on SMEs business directly and indirectly. Therefore, we recommend that NSG include non-financial business data in their ecosystem since it can create value by due to many reasons summarized here:

- Access to data is crucial for the pricing of products and for minimizing CE-taxation through requirements of recyclability of products and materials (non-recyclability charge).
- The new Green Economy open large business potentials for SMEs and this requires real time data on the products and services they deliver.
- The documentation and reliability of the new business data on CE, GHG and sustainability is essential for companies to create trust to new products and business models ensuring a sustainable value chain.

- Access to real time data including product data will minimize bureaucracy and costs due to unbroken flow of data (einvoice) within companies and between companies and authorities.
- The avoidance of many different subsystems locally in the companies that may decouple many SMEs in the transition to a Green Economy.
- Increasing incidents of fraud within the supply chain on both materials and data requires transparency, traceability and compliance through a new set of legislation from Authorities. This has a strong financial impact on SMEs and their business models through future taxation and pricing of products where the documentation of sustainable, circular products will be freed from charges.

In this way CE and Sustainability adds new parameters to the landscape of competitive advantages especially in the developed world. The Nordics and in EU generates a relatively large amount of waste and GHG Emissions - through our high consumption of meat, goods, intensive farming, energy and transportation. A transition to a Green Economy has a higher impact here than in developing countries where people and production has a much lower impact on Climate Change and where some circularity is still in place. Investments are required to change the existing business models creating a higher impact in the Nordics and investors need data to make the right decisions.

Non-financial data must flow in an unbroken chain within companies, and between companies and authorities without a load of manual registration in many separated systems. NSGs goal is to support the unbroken flow of financial data. Therefore it would be relevant for NSG also to include non-financial data in the ecosystem and to the benefit of Nordic SMEs.

Online ERP-systems are available and are compatible with a well-structured ecosystem as NSG. Many ERP-systems can handle non-financial business data as; product and material codes. Product and material codes exists today in selected branches, but standardization is required to avoid burdens and ensure flow of uniform data. Product codes and catalogs must be developed together with the Industry, the Trade Associations and relevant Authorities to create common standards. This is already in place for some industries within food, steel and others. As an example of an industry that recently has developed recommendation and manuals for recycling of their materials is the Plastic Industry in Denmark and these are recommendations are expected to be adopted by law.

Therefore, we recommend product codes and product catalogs on branch levels developed in close cooperation with the industries that has the material and material flow knowledge. Catalogs must be developed, kept and maintained on regional and/or national levels.

On a Nordic level CE offers green growth and new employments with more blue color jobs locally due to more local production, and manual work in the recycling sector; as maintenance, repair and disassembly of products. The transformation to a green economy is also a transformation of our labor force and to some extend also to bring back production to European countries supported by new technologies in the Industry 4.0 era.

High hourly rates and wages and higher standards for compliance in the Nordics are reasons for SMEs here to meet these challenges earlier than in the southern Europe. Efficient sharing of information and real time data increases the value of data from a smart ecosystem for SMV commercially. New technologies will be developed and implemented to meet the new Green Economy and demands for real time data availability and this requires standardization to simplify data flows.

5. SOURCES

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9. REACH: EU Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals" See: <https://echa.europa.eu/da/regulations/reach/understanding-reach> for more details.
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6. APPENDIXES

A. GHG EMISSIONS PER CAPITA FOR BACKGROUND

Country (2012)	Tonnes GHG per cap
Sweden	7.2
Norway	13.7
Iceland	13.1
Finland	14.6
Denmark	10.2
EU28 average	9.0
Global average	6.5
China	8.8
USA	19.6

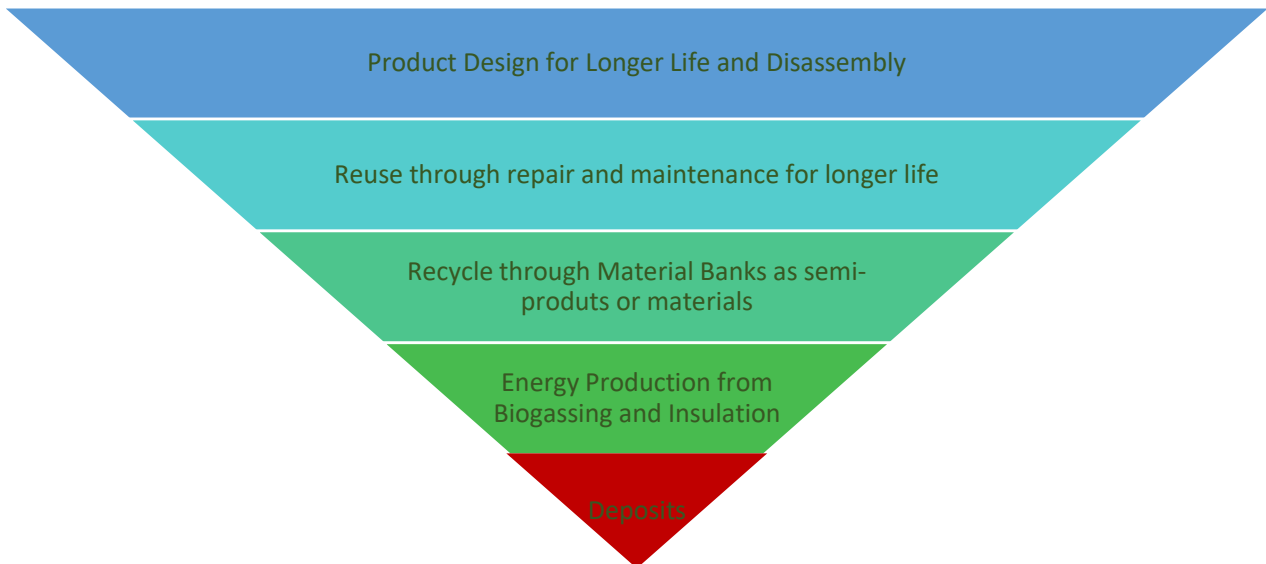
Source: EDGAR, Emission Database for Global Atmospheric Research

Note: GHG emissions from production of exported goods are included in the production country why China has a relatively high emission per capital.

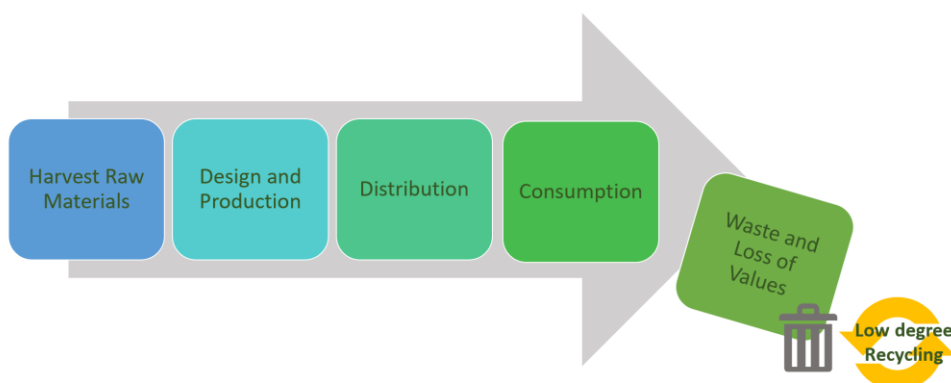
B. SHORT ON CIRCULAR ECONOMY

Due to increasing populations and increasing wealth around the globe there is an increasing demand for raw materials. UN expects the global population to number 10 billion around 2050 – with population growth mainly in the less developed countries. It is also expected that 1.5 to 2 billion people will enter the middle class over the next one to two decades doubling the global middle class. This is very good news when so many people will exit poverty, but this will cause a tremendous pull on resources globally to satisfy the needs of more and richer people. Interestingly, many of the raw materials we use for products and energy production are found in the least populated and/or least developed areas, as Africa, South America and Australia. Meaning that Europe including the Nordics and China import and historically has imported lots of raw materials and goods from other continents causing an economic and political dependency. Additionally, commodity prices of energy, food etc. has risen since the new millennium and now we have a global situation where prices of raw materials are controlled by the supply rather than by demand as it was until now. This new supply creating economy is a shift in the global economy. Material costs are the largest costs in the production industry amounting to approx. 40% of the cost base compared to labor cost that amounts to only 20% depending in this part of the World. This means that we need a new economical thinking to ensure access to raw materials and to be able to support the existing wealth of people in Europe and the Nordics.

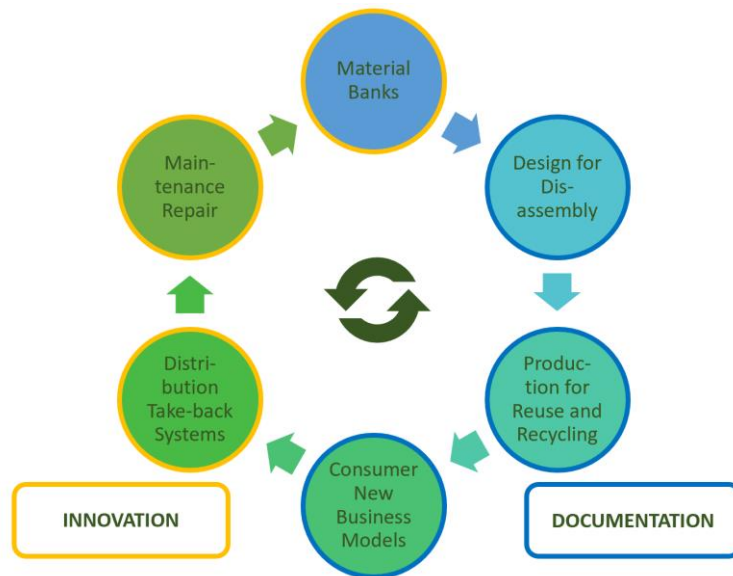
The principle of the CE is to maintain as much value in the products as possible instead of disposing our products as waste. The value pyramid illustrates maintenance of value very well:



The last four decades *“fast moving consumer goods”* has evolved tremendously resulting in a shift in how things are produced at the expense of quality and product lifetime. The latest 10-20 years more and more products are designed for short lifetime and ends up in deposits or for energy production. Products end their lives earlier and the quality of things put on the market today is significantly poorer than just a few years ago. This especially apply for building materials, textiles (clothes), electronics and cars. We are now disposing building materials when we renovate houses that has lasted for more than 70 years and replace them with building materials that have a maximum lifetime of 20 years. The high-quality building material potentially could last as 70+ if they were repaired and maintained. The same is applicable for textiles and clothes and consumers only wear their clothes in an average of 6 times before they dispose, thus quality is declining rapidly. This also means that we now dramatically lower the potential for reusing and recycling materials. There is a large economical potential in changing this linear economy to a circular economy where values are maintained with our products. The Linear Economy can be illustrated as below:



Within the next 10 years the European Economy will transform (back) into a Circular Economy and the overall concept of this is illustrated as:



The main barriers of a transition to a Circular Economy is the development of clean, separated, traceable materials through tack-back systems for every material group ensuring a sufficient quality and volume of materials and semi-finished goods in material banks for companies to recycle and but new recyclable products back on the market. This requires that reused and recycled materials and products meet sustainability, safety and security requirements at the same level as new products. Additionally, there will be extensive legislation on expansion of product lifetime, guaranties of repair and maintenance in future. We already today see countries setting stricter requirements to products and producers than the 2-year European Guaranty required today.

The CE will result in new sectors within recycling, material handling, material banks, repair and maintenances labs with new jobs for craftsmen and unskilled workers and therefore the CE is expected to bring jobs, growth and production back to Europe to ensure the high welfare that we have gained here. Baring in mind that the welfare of Europe historically was gained from raw materials harvested on other contingents which we will not have access to in future. Therefor CE is in the central of a future sustainable economy in Europe and with the positive side effect of a more sustainable, green and transparent production.

