



Nordic Council
of Ministers



Nordic Swan Ecolabel and Organisation Environmental Footprint

Focus on the organisation
environmental information
used in the retail sector

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Hanna Salo, Johanna Suikkanen and Ari Nissinen

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Figure 2: OEFSR development process according to OEF Guidance v. 6.3 p. 33

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Contents

List of abbreviations	7
Foreword.....	9
Executive Summary.....	11
1. Introduction	13
1.1 Background	13
1.2 Objectives.....	14
1.3 Materials and Methods	15
2. Basic Information on Swan and OEF	17
2.1 The Nordic Swan Ecolabel.....	17
2.2 Organisation Environmental Footprint	23
3. Grocery Stores and the Retail Sector in Swan and OEF Schemes.....	33
3.1 Introduction.....	33
3.2 Grocery stores in the Swan scheme	34
3.3 Organisation Environmental Footprint Sector Rules for Retail	37
4. Comparison	45
4.1 Introduction.....	45
4.2 Goals	46
4.3 Functional Units.....	46
4.4 Reference Flow	48
4.5 System boundaries	51
4.6 The Most Relevant Identified Environmental Impact Categories.....	54
4.7 Life Cycle Stages.....	56
4.8 Environmental Management Systems.....	58
5. Discussion	61
5.1 Introduction.....	61
5.2 Basis	61
5.3 Functional Unit, Reference Flow and System Boundary	62
5.4 Most Relevant Environmental Aspects and Life Cycle Stages	63
5.5 Actor Perspectives on the Schemes.....	64
6. Conclusions and Recommendations	69
References	73
Sammanfattning	77
Appendix I	79
Appendix II	81

List of abbreviations

B2B	Business to business
EC	European Commission
EMS	Environmental management system
NACE	Classification of economic activities. An acronym for "Nomenclature générale des Activités économiques dans les Communautés européennes"
NCM	Nordic Council of Ministers
OEF	Organisation Environmental Footprint
OEFSR	Organisation Environmental Footprint Sector Rules
PEF	Product Environmental Footprint
RPS	"Relevance", "Potential", "Steerability"
TS	Technical Secretariat

Foreword

The European Commission has introduced the concept of an Organisation Environmental Footprint (OEF) along with the Product Environmental Footprint (PEF) to be used as common measures of environmental performance. The OEF focuses on organisations and aims at harmonising the wide field of environmental labels and claims in Europe with a life-cycle-based measure for individual sectors. It aims to act as a facilitator of the single market for green products in Europe.

This report has been prepared as a part of the “Nordic Swan, Circular Economy and Product Environmental Footprint” project (2016–2019) funded by the Nordic Council of Ministers (NCM) as one of the projects of Finland’s Presidency in 2016. The project studies the product-group or sector-group specific criteria of the Nordic Swan Ecolabel, the PEF and the OEF methodologies, and how the information provided by life cycle assessment based EFs could be used by the Nordic Swan Ecolabel.

This TemaNord report focuses on environmental information of the Nordic Swan Ecolabel Scheme and the OEF pilot phase. It analyses the related documents in order to assess synergies, complementarities, and differences in the two approaches. The authors would like to acknowledge the contribution of Karin Bergbom (Nordic Swan Ecolabel, Finland) and Elisabeth Magnus (Nordic Swan Ecolabel, Norway), Caroline Karlsson and Per Sandell (Nordic Swan Ecolabel, Sweden) as well as Jáchym Judl (Finnish Environment Institute) for their help, feedback and proposals for improvement. However, the authors are solely responsible for the results and conclusions.

Helsinki, June 2019

The authors

Executive Summary

The Organisation Environmental Footprint (OEF) initiative of the European Commission (EC) aims to establish and test a common methodology to measure and communicate the environmental performance throughout the life cycle of an organisation and its products. The eventual role of the OEF as an additional policy tool in the European market could change the use of existing tools, including ecolabels, and will be decided later on by the EC.

In this study, we discuss the OEF method and compare it with the Nordic Swan Ecolabel (Swan). The focus is on the environmental information used and produced, concerning grocery stores and retail sector in the two schemes. The study examines the final and working versions of the OEF pilot phase, and both publicly available, finalised documents and internal records of the Swan. The report aims to determine how the two schemes compare on the level of their goals, methodological approaches, outputs, and communication with the public in order to identify differences and similarities, along with possible synergies between them.

OEF Sector Rules (OEFSRs) provide sector-specific guidance for performing an OEF Study. The guidance represents substantive, technical instructions on assessing life cycle impacts of products provided by the organisation. The OEFSR Guidance documents outline procedures for identifying the most relevant impact categories, life cycle stages, processes, and elementary flows within the life cycles. The output is an “OEF Profile” indicating the environmental performance of the organisation. Different internal and external communication vehicles are being tested by the European Commission while this report is being written.

The Nordic Swan Ecolabel was established in 1989 and is well-known among producers and customers in the Nordic countries. The scheme grants a license for the best performing products and organisations in their category. The Nordic Ecolabelling Board defines the level of performance indicating the “best in its category” and sets criteria with minimum levels for organisations. The criteria are evaluated using an “RPS” approach, standing for “Relevance” (R), “Potential” (P), and “Steerability” (S) in order to define what aspects are significant in the sector and where environmental gains can be achieved by introducing the Swan. Environmental, health and social aspects with the highest environmental impact, i.e. hotspots, are often assessed with a method called “MECO” (Materials, Energy, Chemicals, and Other).

In order to illustrate similarities and differences between the outcomes of the schemes, we compared the OEFSR Retail and Nordic Swan Ecolabel’s Criteria Document for grocery stores, as they are the only sector for which guidance has been established in both schemes. It should be noted that due to different methodological approaches and frames, the results are not completely comparable. The OEF provides an LCA-based calculation method for a set of 16 environmental impact categories. The

Swan Criteria are set based on available LCAs to define the environmental aspects, but with more flexibility than the OEF. It also takes into consideration non-quantifiable information and qualitative expert judgements in the criteria setting along with health and social aspects.

Both schemes ultimately aim at making consumption and production more sustainable, but their approaches vary. The goal of the Swan is to push stores to perform better and to help customers make environmental choices, whereas the OEF aims to create a common methodology and to enable the use of high quality, open data in environmental performance calculations. The Swan grants a license to a store that mainly sells groceries, while a retailer selling a broader category of products, for example, food, pets, and gasoline, can use the OEF. The Swan focuses on the hotspots related to the operation of a store and its product range, whereas the OEF takes into consideration the processes and sites controlled by the retailer and the upstream and downstream impacts related to the products the retailer provides.

The comparison in this report indicates that the environmental information given by the two schemes differs. The environmental impact groups appearing in the Swan criteria are slightly different to the environmental impact categories of the OEFSR evaluated as “most relevant” for retail. They both find four common aspects important and there are three impact categories that they do not share. This difference between the most relevant impact categories is due to different views on important life cycle stages, as the Swan sets requirements for only those stages with a high overall RPS, which partly concerns different stages to the OEF. Exclusions have been made to the life cycle stages of the OEF virtual retailer, which has been used as the basis for identifying the most relevant environmental aspects. These exclusions increase the differences between the two schemes.

In this report, we identified possible synergies between the Swan and the OEF. The synergies concern three important factors, which are criteria setting, measurement, and communication:

- The Swan could consider setting criteria based on existing OEF studies for retail or on a new OEF study for grocery stores. The OEFSR could be used to identify environmental hotspots for the Swan to define its focus. The Swan could award stores for reducing the sales of product with high negative environmental impacts indicated in the OEF;
- The Swan could use the OEF to identify the environmental impacts of the store and the products it provides in their criteria setting;
- Local ecolabelling schemes, such as the Swan, could help the OEF to take the geographical context of organisations into account when applying the default data;
- Ecolabels, such as the Swan, could be used for communicating the best performing stores based on the OEF to consumers.

1. Introduction

1.1 Background

The European Commission (EC) launched a pilot project to measure Product Environmental Footprints (PEF) and Organisation Environmental Footprints (OEF) in 2013. Their aim is to harmonise the broad range of methods and initiatives available for marketing green products. Nowadays, there is a large range of choices to express environmentally friendly products. These may be confusing to customers due to incomparable and diverse environmental information. Moreover, a company may have to fulfil various requirements in different markets.¹

The pilot aims to develop a common, harmonised method for measuring environmental performance of products in the European Union market.² It tests a harmonised European set of methodological requirements for quantifying the environmental footprints over the life cycle of a product or an organisation. The pilot phase consists of 17 finalised and four discontinued PEF pilots and two OEF pilots: retail and copper production. Different communication vehicles have been tested during the pilot phase.³ The pilot phase is followed by a transition phase for the period 2018–2020, during which modelling and testing of the scheme will continue.⁴

The OEF has utilised the already existing methodology guides in its development process. These guides are the Global Reporting Initiative (GRI) 3.0, the ILCD Handbook, ISO 14064:2006, the working draft of ISO WD/TR 14069, the WRI/WBCSD Greenhouse Gas Protocol (2011), Bilan Carbone (version 5.0), Defra's guidance on how to measure and report your greenhouse gas emissions (2009), and the Carbon Disclosure Project for Water (2011).⁵

The OEF has been set to achieve the objectives of the EC for the environmental performance tracking of products and organisations, which the present schemes do not fulfil. According to Chomkhamisri and Pelletier (2011, p. 58), the existing organisational environmental accounting guides focus on reporting-related issues and they lack substantive technical guidance. Therefore, the OEF has been set to outline specific, prescriptive methodological standards to be used in the European Union.⁶ The EC employees Pelletier *et al.* (2013) have stated that the common methodology for the European market should be a multi-criteria, life-cycle-based approach that considers

¹ European Commission (EC), 2018b.

² EC, 2016c.

³ See the final report on the assessment of different communication vehicles for providing Environmental Footprint information (2018) at http://ec.europa.eu/environment/eusssd/smgp/pdf/2018_pilotphase_commreport.pdf

⁴ EC, 2018a.

⁵ EC *et al.*, 2012.

⁶ Chomkhamisri and Pelletier, 2011, p. 57–58.

all organisational and related activities throughout the supply chain, provides for reproducibility and comparability over flexibility, and ensures physically realistic modelling. Based on their evaluation, the current schemes, such as the GRI 3.0, GHG Protocol Scope 3, and ISO 14064 and 14069, are not consistent and do not meet the set criteria. None of the existing schemes use a method that would produce reproducible and robust analytical outcomes of an organisation's environmental life cycle impacts.⁷ According to Pelletier *et al.* (2013, p. 402) organisation environmental footprint studies are considerably less advanced than those of products.

The Nordic Swan Ecolabel, introduced in 1989, is an official information tool and brand on the Nordic market. The Swan's objective is to encourage the demand for and supply of products that cause less stress on the environment as a Type 1 Ecolabel according to ISO 14024:2018. The Swan aims at defining what can be considered a "best performing" product in a product group and setting criteria at that bar and providing clear-cut information to consumers and purchasers.⁸ It has also set criteria for services. Other existing schemes to measure the retail sector's performance are the German Der Blaue Engel, the Swedish Bra Miljöval and KRAV, the Norwegian Miljøfyrtårn, and the Danish Grøn Butik. There are also schemes that focus on features of the retail sector, such the green building certificate LEED and BREEAM.⁹

1.2 Objectives

This TemaNord report is part of the "The Nordic Swan, Circular Economy and Product Environmental Footprint" project (2016–2019), under which also the reports "Circular Economy and the Nordic Swan Ecolabel: An Analysis of Circularity in the Product-Group-Specific Environmental Criteria" and "Nordic Swan Ecolabel and Product Environmental Footprint" have been published (TemaNord 2017:553; Nordic Working Paper 2017:910). The Nordic Council of Ministers is funding the project. The project aims to clarify how the Nordic Ecolabel is adapted to the circular economy and aims to identify implications and possible synergies of the forthcoming EU Product Environment Footprint (PEF) scheme on the Nordic Swan Ecolabel.

This report concentrates on another aspect of the PEF pilot project, the development of the Organisation Environmental Footprint (OEF). The report compares the OEF and the Nordic Swan Ecolabel (Swan). It includes a case study on the retail sector. The report aims at discovering the similarities and differences concerning the use and production of environmental information, along with the synergies and opportunities for cooperation between the two schemes.

⁷Pelletier *et al.*, 2014.

⁸Nordic Ecolabelling, 2017e.

⁹SuperSmart, 2017.

The report describes the backgrounds, goals, methodologies, and communication of the Swan and the OEF. It compares the organisational approaches used to evaluate the environmental performance in the retail sector. This report has been written alongside the “Nordic Swan Ecolabel and Product Environmental Footprint” and thus refers to some of the background information, discussion, and results represented there.

1.3 Materials and Methods

The study uses documents concerning the OEF and the Swan provided by official sources who have participated in the requirement development processes. We conducted a document review as well as interviews and discussions with the representatives of the schemes. The documents used are represented in Table 1.

Table 1: Materials

Nordic Swan Ecolabel	OEF
Goals and Principles for the Nordic Ecolabel (2014)	OEF Guide (2012)
MECO Guide (2013)	OEFSR Guidance Version 6.3 (May 2018)
RPS Guidance (2013)	OEF Sector Rules Retail (April 2018)
Product-group specific criteria document for Grocery stores v. 3.2 (2017) and its background document v. 3.1 (2016)	OEF Retail screening report (2015)
Meetings with representatives of Nordic Ecolabelling Karin Bergbom and Elisabeth Magnus	Email conversations with An de Schryver from the European Commission
Phone interview with Caroline Karlsson and Per Sandell from Ecolabelling Sweden	
Reviews of the different manuscript versions by Bergbom and Magnus	

2. Basic Information on Swan and OEF

This chapter introduces the necessary basic information for understanding the two schemes. The Nordic Swan Ecolabel (Swan) awards a license to the best performing products and organizations among their categories in the Nordic countries to help consumers make purchasing decisions and act as a benchmark for organizations. The Swan chooses focus points based on analyses of the relevance, potential and steerability of environmental issues. The Organisational Environmental Footprint (OEF) has been developed by the European Commission and tested in a pilot phase (2013–2018). It aims to assure a reliable means of communication by setting harmonized sectoral rules. Representative organizations, product portfolios and the most relevant environmental aspects have been demonstrated for the sector. The chapter furthermore describes how the criteria and rules are developed, their data requirements and communication methods.

2.1 The Nordic Swan Ecolabel

2.1.1 Introduction

The Nordic Swan Ecolabel (Swan) is a voluntary and multi-criteria-based Type 1 environmental labelling programme according to ISO 14024.¹⁰ Based on this standard, an organisation is granted a license that authorises the use of an environmental label for its product. This indicates the overall environmental preferability in a specific product group based on life cycle considerations. The objective of ISO 14024 is to reduce environmental impacts over the life cycle of a product, and therefore product-related environmental criteria are set to identify the environmental impacts and potential for improvement in the extraction of resources, manufacturing, use, and disposal.¹¹

The ecolabel is a tool designed to direct the market towards greener products and services with the ultimate goal of achieving a sustainable society. The Swan is well-known by Nordic consumers: Approximately 89% of them are familiar with the label and a quarter of them always or often look for Swan ecolabelled products.¹² Today, it covers 60 product groups with over 10,000 products and services from hotels to

¹⁰ NCM, 2014.

¹¹ ISO, 2018.

¹² Ipsos, 2017, as cited in K. Bergbom, personal communication, 25 October 2017.

investment funds. The Nordic Swan Ecolabelling organisation is a member of the Global Ecolabelling Network (GEN) for ecolabels.¹³

The following sections present information concerning the Swan and its background, goals, methods for setting the criteria and criteria development, and participation of the Nordic Swan Ecolabel Scheme. The information presented in the following sections acts as the basis for the comparison between the Swan and the OEF.

2.1.2 Policy Background and Guiding Documents

The Nordic Council of Ministers (NCM) established the Nordic Ecolabel on 6 November 1989. As determined by the NCM, the Swan continues to be an important instrument for achieving the goals of sustainable consumption and production.¹⁴ “The Goals and Principles for the Nordic Swan Ecolabel”, adopted by the NCM for the Environment on 22 October 2014, direct the Ecolabel’s work.¹⁵

The Nordic Ecolabelling Scheme is a non-profit organisation supported and partly funded by all the Nordic Governments. Most of the funding comes from license fees. It is administered through a joint Nordic Swan Ecolabelling organisation and national ecolabelling organisations in each five Nordic countries. A Nordic board, consisting of members from all of the member countries, adapts the environmental strategy and regulations, approves new product groups and establishes criteria for the specific product groups. The criteria are applicable in all Nordic countries, and none of the countries can create criteria or product groups on their own. A valid license in one of the member countries is also valid in the whole region.¹⁶

For more information on the Swan see the “Nordic Swan Ecolabel and Product Environmental Footprint” and “The Nordic Swan Ecolabel and the Product Environmental Footprint: Focus on Environmental Information” (Working Paper 2017:910; TemaNord 2019:544).

2.1.3 Goals

The Nordic Swan Ecolabel aims at reducing the environmental impacts of consumption and production by using voluntary ecolabelling. When relevant to a product group, also criteria regarding health and social aspects are set. It is a consumer-policy tool for the environment, and it complements other environmental policy instruments. It is also intended to help consumers, retailers and manufacturers to develop and choose environmentally sound products and services with high standards of quality.¹⁷ The Swan is designed to help consumers to distinguish environmentally preferable products and services from other similar products in the same category. This goal is carried out through a straightforward communication mechanism indicating the environmental

¹³ Nordic Ecolabelling, 2019.

¹⁴ NCM, 2012.

¹⁵ NCM, 2014.

¹⁶ NCM, 2014.

¹⁷ NCM, 2014.

performance of the product. Consumer choices, including purchaser choices for ecolabelled products are expected to create market pressure on producers, leading to the development of products and services with better environmental performance.¹⁸

The Swan aims to reduce various environmental impacts resulting ranging from the choice of certain raw materials, hazardous chemicals, energy and the resulting emissions, health aspects, noise and waste. This is why the requirements for environmental performance are revised and strengthened periodically. The revision takes place in order to create a push for the development of products and their features towards better environmental performance and to take new emerging issues into consideration. The criteria are defined at a level where a maximum of 30% of the products on the Nordic market fulfil them and are awarded with a license to use the Swan Ecolabel.¹⁹

2.1.4 Criteria Setting for Nordic Swan Ecolabel

Methodological approach for assessing an organisation's environmental performance

The Swan criteria are set through a so-called "RPS" process, which is an analysis tool to evaluate the environmental priorities. It assesses the relevance, potential, and steerability (RPS) of environmental issues related to products to achieve the greatest possible environmental benefit. The RPS model is used to select the product groups and services suitable for ecolabelling, indicating where the focus of the criteria should be, and developing the requirements. All of the three RPS factors must be at a high or medium level:

- *Relevance* identifies the environmental problems and their extent;
- *Potential* determines if there is something that could be done about the problem;
- *Steerability* indicates whether the Swan can influence the problem.²⁰

With these factors, the Swan identifies the product groups and services which should be prioritized, and how the environmental requirements should be emphasized. The RPS procedure takes place in order to gain maximal environmental benefits in the Nordic Market.²¹ At the same time, it prevents the burden shift of environmental impacts from one point to another, such as from a store to a wholesaler.²²

The most significant environmental impacts of a product's life cycle can be assessed using the MECO method, which stands for material, energy, chemicals, and

¹⁸ Nordic Ecolabelling, 2017c.

¹⁹ NCM, 2014.

²⁰ Nordic Ecolabelling, 2013a.

²¹ Nordic Ecolabelling, 2013a.

²² Nordic Ecolabelling, 2016a, p. 7.

other.²³ This is only used when appropriate.²⁴ It indicates where in the life cycle the environmental impacts and energy use are the largest and thus relevant for the product group. An MECO analysis is composed of three steps: determining the purpose of the study, collecting data, and data formulation into an MECO chart. The first step defines whether the analysis is quantitative or qualitative, or a combination of both, and describes the functional unit, system boundaries, and the reference flow.²⁵ The second step is focused on collecting readily available data from published reports, scientific literature, LCA studies, Environment Product Declarations (EPDs), Green Procurement documents, the EU's Best Available Techniques Reference Documents (BREFs), and from dialog with NGOs, governments, industry, and other stakeholders.²⁶ The third step, formulating the collected data into an MECO chart, is not obligatory.²⁷

The MECO analysis categorises environmental impacts into at least four following causes:

- *Materials* needed to produce, use, and maintain the product in kilograms;
- *Energy* used during the life cycle of the product, indicated in terms of the energy use (kWh or MJ) and energy source (renewable/non-renewable);
- *Chemicals* added to the product, used in the production or user phase;
- *Other* includes environmental impacts that do not fit into the other categories, such as biodiversity, land use, and ethical issues.²⁸

More information about the methodological background of the Swan can be found in the Nordic Working Paper "Nordic Swan Ecolabel and Product Environmental Footprint" and the more recent "The Nordic Swan Ecolabel and the Product Environmental Footprint: Focus on Environmental Information" (Working Paper, 2017:910).²⁹

Process for setting Swan criteria

The Nordic Swan Ecolabel criteria are set according to the principles and processes outlined in ISO 14024:2018 and "Goals, and Principles for the Nordic Ecolabel".³⁰ The Swan has set criteria documents to specify the requirements for each product area. The product groups are chosen based on potential environmental benefits and the need of consumers and purchasers for guidance with regard to environmentally sound products and services. The value of ecolabelling a product group is assessed in relation to, among other things, the current market situation, technical development, and other relevant environmental systems. The criteria include environmental and market-related sub-

²³ Nordic Ecolabelling, 2013b.

²⁴ E. Magnus, personal communication, 15 September 2017.

²⁵ Nordic Ecolabelling, 2013b, pp. 5–11.

²⁶ Nordic Ecolabelling, 2013a; E. Magnus, personal communication, 15 September 2017.

²⁷ Nordic Ecolabelling, 2013b, p. 13.

²⁸ Nordic Ecolabelling, 2013b, pp. 14–20.

²⁹ Suikkanen and Nissinen, 2017.

³⁰ NCM, 2014.

targets for each product group,³¹ such as the sale of ecolabelled products and the production of food waste in grocery stores.³²

According to ISO 14024:2018, product environmental criteria are environmental requirements that the product shall fulfil in order to receive an environmental label. The aim of the criteria is to differentiate the products based on their measurable environmental impacts and indicate the best performing products with the label.³³

Each criteria document specifies the following subjects:

- Product group definitions and potential exclusions;
- Environmental, health, quality, and regulatory requirements;
- A description of verification procedures and appendices with forms that the applicant must fill;
- New future criteria with ideas for new criteria for the next revision.³⁴

Experts from the Nordic Ecolabelling organisations develop new proposals for criteria (Figure 1). Prior to the criteria development process, feasibility studies, a light RPS study and a pre-study are conducted to support the development process. Environmental organisations, industries, and governments are invited to represent their views on the proposals. Information about the proposal is sent to a Nordic contact list to government organisations, NGOs, industry, producers etc., and a list of product group and sector specific contacts.³⁵ The proposal is also available to the public on the websites of the Nordic Ecolabelling organisations. After the received comments are discussed, the Nordic Ecolabelling Board adopts the final criteria for the product groups.³⁶ All the documents are available on the websites of the Nordic Swan Ecolabelling organisations of the five member countries.³⁷ The criteria take into consideration the Nordic countries' official environmental regulations but as a voluntary system, the Swan goes further than laws and regulations,³⁸ and can act according to its own principles.³⁹

A similar process to the one described above is applied when the criteria are revised. The validity period of the criteria is indicated in each criteria document. The revision takes place periodically, usually every three to five years,⁴⁰ to push forward the gradual development towards sustainability. The new criteria and adjustments to the previous ones are made according to new knowledge, technical adjustments, expertise,

³¹ Nordic Ecolabelling, 2016c.

³² Nordic Ecolabelling, 2017d.

³³ NCM, 2018, p. 3.

³⁴ Nordic Ecolabelling, 2019.

³⁵ Nordic Ecolabelling, 2018 and E. Magnus, personal communication, 15 September 2017.

³⁶ Nordic Ecolabelling, 2017b.

³⁷ Nordic Ecolabelling, 2017d, p. 4.

³⁸ NCM, 2014; Motiva Services Oy – Ympäristömerkintä 2017a.

³⁹ NCM, 2014.

⁴⁰ Motiva Services Oy – Ympäristömerkintä 2017a.

and experience from the licensees.⁴¹ If the requirements are tightened, new generation criteria are issued. If these are modified or altered, a new version will be published.⁴²

The development of the criteria of the Swan is depicted in more detail in the “Nordic Swan Ecolabel and Product Environmental Footprint” and “The Nordic Swan Ecolabel and the Product Environmental Footprint: Focus on Environmental Information”.

Figure 1: Project flow for criteria development at Nordic Ecolabelling



Note: Figure produced by Nordic Ecolabelling ©.

2.1.5 Participating in the Nordic Ecolabelling Scheme

Applying for an Ecolabel

When the criteria document for a product group is finalised, businesses are able to apply for the right to use the Swan ecolabel on their product belonging to the category in question. The business is liable to provide documentation demonstrating that the product meets the set criteria for the product group. A licensing process takes place after the Nordic Ecolabelling organisation has received an application and the required application fee has been paid. The fee is meant to cover the application and investigation process. The Nordic Ecolabelling organisation then investigates whether the product fulfils the criteria by taking samples from independent laboratories, awarding certificates and conducting onsite audits.⁴³ Applicants fulfilling the set criteria are granted a license as per ISO 14024.⁴⁴ In addition, the applicant must pay an annual

⁴¹ Nordic Ecolabelling, 2017b.

⁴² Nordic Ecolabelling, 2017d, p. 4.

⁴³ Nordic Ecolabelling, 2017a.

⁴⁴ ISO, 2018.

license fee, which varies based on the turnover of the ecolabelled product.⁴⁵ The license is operable in the Nordic country receiving the application. In case an applicant is looking to use the ecolabel in other or all Nordic countries, it needs to register the license in each country by completing a specific form available on the Nordic Ecolabelling website.⁴⁶

Data requirements

In the Swan, an applicant must provide primary data of all of its functions and products that the criteria concern. An applicant that has data of certain operations is considered to have influence over the operations and therefore to be able to change them in order to achieve environmental gains. Only in exceptional cases, is the use of secondary data allowed as a part of the documentation.⁴⁷

Communication of environmental performance

The published criteria documents, background documents and names of ecolabelled products and license-holders are all available online on the Nordic Ecolabelling websites. License-holders have the right to use the logo of the Swan label on the product, web pages, and marketing material.⁴⁸

2.2 Organisation Environmental Footprint

2.2.1 Introduction

The European Commission launched the PEF/OEF pilot in 2013 to harmonise the broad range of methods and initiatives available for marketing “green” products. Currently, there are a large range of choices to express environmentally friendly products, which may be confusing to consumers due to incomparable and diverse environmental information and a company may have to fulfil various requirements for different markets. The pilot aimed at developing a common, harmonised method for measuring the environmental performance of products in the European Union market.⁴⁹ The pilot phase consists of 17 finalised and four discontinued PEF pilots and two OEF pilots: retail and copper production.⁵⁰

The OEF is a multi-criteria, life-cycle-based measure of the environmental performance of an organisation providing goods and services. It is seeking to reduce the environmental impacts associated with organisational activities including the whole life cycle of the supply chain from raw material extraction to waste management. The OEF is complementary to other instruments used for measuring the environmental

⁴⁵ Nordic Ecolabelling, 2016b.

⁴⁶ Nordic Ecolabelling, 2017a.

⁴⁷ Magnus E., 2016, as cited in Suikkanen and Nissinen, 2017.

⁴⁸ Motiva Services Oy – Ympäristömerkintä, 2017b.

⁴⁹ EC, 2016c.

⁵⁰ EC, 2017.

performance of specific sites and thresholds, such as the Eco-Management and Audit Scheme (EMAS) and the International Reference Life Cycle Data System (ILCD).⁵¹ The complementarity reduces the potential financial, time, and human resource burdens of performing an environmental footprint study.⁵²

The Joint Research Centre has provided suggestions for updating the OEF method based on the observations during the pilot phase.⁵³ Their suggestions may change the methodology in terms of modelling requirements, data and data quality requirements, and life cycle impact assessment in the future. The comparison provided in this report, however, has been made based on the OEF Guide published in 2013, which continues to be the official document.

The following sections introduce the OEF with its policy background, goals, rules, and information on conducting an OEF study. The information described acts as the basis for the comparison between the Swan and the OEF.

2.2.2 Policy Background and Guiding Documents

The policy background of the OEF relies on the mandate given in multiple official European Union documents: the Communication on Single Market Act (2010), the Council Conclusions on Sustainable Materials Management (2010), the Resource Efficiency Roadmap (2012), and the Communication on Building the Single Market for Green Products (2013).⁵⁴ Suikkanen and Nissinen (2017; 2019) present these in more detail.

Two methods for measuring life cycle environmental performance were proposed in the Single Market for Green Products Initiative (COM/2013/0196) and Commission Recommendation 2013/179/EU.⁵⁵ These are the Product Environmental Footprint and Organisation Environmental Footprint methods. The recommendation concerns the use of common methods to measure and communicate the life cycle environmental performance of products and organisations. Furthermore, it includes PEF and OEF Guides with technical guidance on how to conduct an EF study for a specific category or sector. It endorses the use of the PEF and the OEF to Member States, companies, private organisations, and the financial community.⁵⁶

The OEF pilot began in 2013 and was finalised in 2018. The following documents have guided the OEF pilot phase:

⁵¹ EC *et al.*, 2012, pp. 7–9.

⁵² Pelletier *et al.*, 2014, p. 388.

⁵³ Zampori and Pant, 2019.

⁵⁴ EC, 2016b.

⁵⁵ EC, 2016b.

⁵⁶ EC, 2016c and EC *et al.*, 2012.

- *Organisation Environmental Footprint (OEF) Guide*⁵⁷
- *OEFSR Guidance document* – Guidance for the development of Organisation Environmental Footprint Sector Rules (OEFSRs), version 6.3 May 2018 (and its previous versions).⁵⁸

2.2.3 Goals

The goal of the OEF is to establish a common, harmonised method for measuring the environmental performance throughout the life cycle of an organisation and the products it provides. It creates a consistent set of rules for specific sectors enabling follow-up and communication of environmental performance both internally and externally. The OEF supports international efforts towards a common methodological system to assure a clear, reliable, and comparable way of communicating to all relevant stakeholders, along with increasing the availability of data required to conduct the examinations.⁵⁹

The OEF analyses the life cycles of an organisation's products and thus indicates which products and life cycle stages have the greatest environmental impacts. By conducting the analysis, it is easier to set the focus of prospective actions on the most important environmental aspects and their sources.⁶⁰ The OEF does not require certain environmental performance levels but instead points out the hotspots, i.e. environmental weak points in the impact categories, life cycle stages, and process and elementary flows of an organisation. An OEF study can also be used to support strategic decisions, corporate sustainability reporting, and other sorts of communication to stakeholders.⁶¹

2.2.4 Sector Rules for Organisation Environmental Footprint Development

Methodological approach

The OEF is a Life Cycle Assessment (LCA) based method to quantify environmental impacts of an organisation. OEF Sector Rules (OEFSRs) define the framework of an assessment. OEFSRs give detailed and comprehensive technical guidance on how to conduct an OEF study for a specific sector. Sector rules focus on the most relevant impacts for determining the environmental performance of an organisation built on existing methods and standards for each sector. The guidelines and standards considered in the OEF development include the ISO 14069 and 16064 on Greenhouse Gases, Greenhouse Gas Protocol Scope 3, the ILCD Handbook, and Global Reporting Initiative 3.0.⁶²

⁵⁷ EC, 2012.

⁵⁸ EC, 2018b.

⁵⁹ EC, 2013 and EC, 2016c.

⁶⁰ EC, 2018b, p. 22 and Quantis, 2018, p. 13.

⁶¹ EC *et al.*, 2012, p. 19.

⁶² EC *et al.*, 2012, pp. 8–12.

Representative organisation and products

A representative organisation illustrates a typical organisation of a certain sector in the EU market taking into account its product portfolio. A representative organisation forms the basis for modelling in an OEF screening study, and that is why it has to be included in every OEFSR. It aims to identify the relevant environmental impact categories, life cycle stages, processes and direct elementary flows typical for the sector. If there is large variation between product portfolios or organisations in a sector, multiple representative organisations for different types of product portfolios are defined. This enables the comparison of environmental performance between organisations in the same sector.⁶³ During the pilot phase of an OEF, benchmarking was developed for comparing organisations based on a representative organisation. In this context, the benchmark indicated the average environmental performance of a representative organisation operating in the EU market.⁶⁴ However, benchmarking has been withdrawn from the final OEFSR Guidance version 6.3.⁶⁵

A representative organisation can be either a real or a virtual organisation. A virtual organisation is non-existent but provides an example designed to demonstrate a typical organisation in the sector. Especially, if the technologies and compositions of product portfolios within the sector vary, a virtual representative organisation should be developed. It can be calculated based on aspects such as the average data on the EU level with sales-weighted characteristics of the used technologies, with a product portfolio as a reference. However, there is a risk of overlooking specificities of some technologies, as well as production processes and organization types because of their low market share. The second option is that the representative organisation is chosen from existing organisations in the sector. The real organisation should be as close as possible to an estimated average organisation in the EU market. Known variations in the sector may be examined through a sensitivity analysis during the OEF screening.⁶⁶

A representative product, either virtual or a real one, is used to estimate the overall impacts of an organisation's product category in the OEF. Its purpose is to represent the average environmental impacts of the overall product category. In an optimal case, a PEFCR would exist for every representative product, which could then be used for modelling the product category. This procedure takes place if the products sold by the retailer in that product group match the representative product of PEFCR based on expert judgement. If that does not apply, one or several representative products per product category need to be identified. These shall be the most commonly sold products, based on statistics or an expert judgement in the specific product category of that retailer. If this results in misinterpretation of the environmental impacts of the product category, the expert may define a product to represent the product category the closest in terms of the environmental impacts. The product should also be selected considering the availability of data on the product in the LCI databases.⁶⁷

⁶³ EC, 2018b, pp. 19, 43–44.

⁶⁴ EC, 2016a, pp. 12, 39–40.

⁶⁵ EC, 2018b.

⁶⁶ EC, 2018b, pp. 19, 43–44.

⁶⁷ Quantis, 2018, pp. 27–28.

Environmental aspects evaluated as “most relevant”

Environmental aspects included in the OEFSRs are the most relevant impact categories, life cycle stages, processes, and elementary flows. All most relevant aspects use a cumulative 80% level as their basis, which is discussed in more detail in this chapter. The environmental aspects can be divided into two based on their uses: 1) The most relevant impact categories and life cycle stages serve mainly as a communication context and highlight where the companies should focus their attention to improve environmental performance. 2) The most relevant processes and elementary flows, on the other hand, are more important for designers and engineers to identify actions and to support decision-making.⁶⁸

The most relevant environmental impact categories are defined as all impact categories that cumulatively contribute to at least 80% of the total environmental impact.⁶⁹ They are determined based on normalised and weighted results of the final representative organisation. Each OEFSR lists 16 default environmental impact categories to be used when calculating an OEF profile (See Appendix I).⁷⁰ These categories generally relate to resource use or emissions of environmentally damaging substances. Impact categories are designed to cover the all relevant issues related to the activities of an organisation.⁷¹ However, the three toxicity-related impact categories (human, non-cancer; human, cancer; and freshwater ecotoxicity) are excluded from the most relevant aspect at least until the end of transition phase.⁷²

The most relevant life cycles stages contribute cumulatively to at least 80% of any of the identified most relevant impact categories. The procedure of identifying the most relevant life cycle stages is repeated for all the selected most relevant impact categories separately. Each OEFSR includes a default set of life cycle stages to guarantee harmony between the sectors. The life cycle stages embodied in an OEF study are defined by the scope of the study and its system boundaries (discussed in chapter System boundaries). Thus, the stages to be covered include at least raw material acquisition and pre-processing; production of the product portfolio; distribution and storage; the use stage; and end-of-life. The last two are included in the analysis in case they are within the scope of the OEF study.⁷³

The most relevant processes are those that contribute cumulatively at least 80% to any of the most relevant impact categories. These are used to model each life cycle stage of the identified most relevant impact categories. If the use stage contributes more than 50% to the total impact, then the processes are identified separately for the use stage and all other life cycle stages that were identified to be most relevant in relation to the most relevant impact categories. If the use stage does not exceed 50% of the life cycle environmental impacts, then the life cycle is analysed as a whole.⁷⁴

⁶⁸ EC, 2018b, p. 48.

⁶⁹ EC, 2018b, p. 48.

⁷⁰ EC, 2018b, pp. 45–47.

⁷¹ EC *et al.*, 2012, p. 28.

⁷² EC, 2018b, p. 45.

⁷³ EC, 2018b, p. 48.

⁷⁴ EC, 2018b, p. 49.

The most relevant direct elementary flows are those contributing cumulatively by at least 80% to the total impact of the direct elementary flows of the process, for each most relevant impact category. The analysis is limited to those direct emissions of level-1 disaggregated datasets. This means that the contributions are calculated only against the impact of direct emissions, not against the total impact of the process. The identification of the most relevant direct elementary flows has been excluded from the analysis during the pilot phase, but its inclusion will be reconsidered during the transition phase.⁷⁵

Process for setting Sector Rules

By using harmonised methods and processes and focusing on the most relevant aspects determined, the OEFSRs aim to reduce the time, effort and cost of conducting an OEF study. Each OEFSR includes a sector definition, corresponding NACE codes, a description of the product portfolio, a granularity of the scope and representative organisation(s). In addition, OEFSRs specify organisation-specific mandatory processes to be included within system boundaries and elements which require primary data to be provided by the specific organisation.⁷⁶ The OEF Guide steers the development of the OEFSRs. The structure and the process for setting OEFSRs are defined in the Organisation Environmental Footprint Sector Rules Guidance (version 6.3 May 2018).⁷⁷

Sector-specific Technical Secretariats (TS) are responsible for the open and transparent coordination of preparing an OEFSR following the ISO 14020: 2000.⁷⁸ TS themselves may constitute a single company, an industrial association, an NGO, a Member State, a national or an international institution, university, research institute, or preferably a mix of them. The TS invite and involve SMEs, consumers and environmental associations in the OEFSR development process. To represent the sector in question, a TS shall involve the major competitors or their representatives that cover at least 75% and the industry stakeholders covering at least 51% of the EU market in terms of yearly turnover or production.⁷⁹ The European Commission, with the support of Environmental Footprint Helpdesk, systematically performs technical checks to support the work of the TS.⁸⁰

The process of developing OEFSRs has been tested during the pilot phase in the 2013–2018 period.⁸¹ OEFSRs are developed through a process consisting of the preparation of a screening report, stakeholder consultation, and supporting studies. The process for developing OEFSRs is represented in Figure 2. After defining the sector and product portfolio in question, an OEF screening is completed. The TS carries out a screening study to pre-identify the most relevant environmental aspects and set data requirements for the OEFSRs. It is an iterative process improving the accuracy and representativeness of the model. Following the screening and related consultations, a

⁷⁵ EC, 2018b, p. 50.

⁷⁶ EC, 2018b, p. 23, 29, 33.

⁷⁷ EC, 2018b.

⁷⁸ ISO, 2000 and EC, 2018b, p. 30.

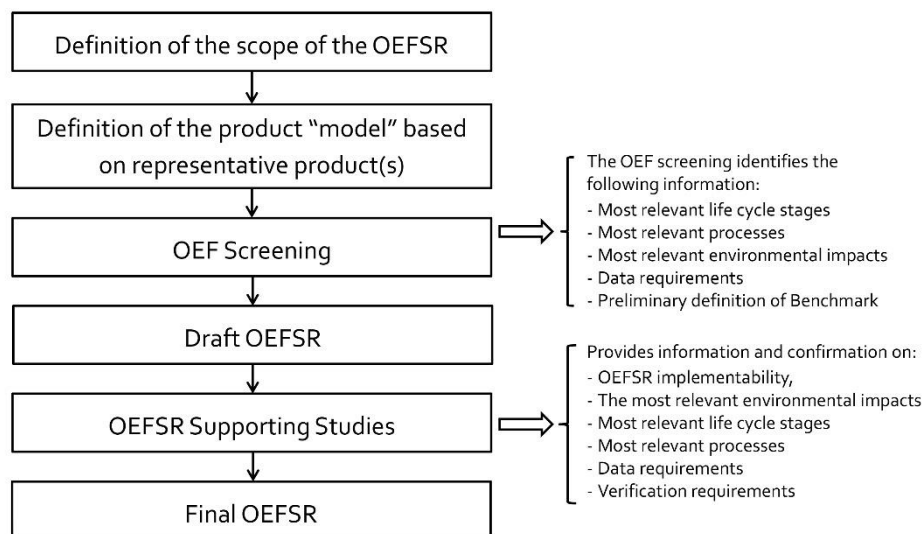
⁷⁹ EC, 2018b pp. 28, 31–32.

⁸⁰ EC, 2018b, p. 28.

⁸¹ EC, 2018c.

draft OEFSR is formulated. A draft OEFSR guides the OEFSR supporting studies, which support the development and revise the draft OEFSR. The TS shall encourage the participants to conduct at least three supporting studies or at least one study for each sub-category included in the OEFSR. The unit processes, data sources and compliance with the OEF Guide, OEFSR Guidance and the OEFSR of the supporting studies must be verified before publishing the results of the study. After all these phases a final OEFSR is formulated.⁸²

Figure 2: OEFSR development process according to OEF Guidance version 6.3 (p. 33) ©



The OEFSRs are finalised following the observations of a third-party review panel's comments and suggestions. The panel shall consist of at least one LCA expert, one NGO representative and one industry representative. The review takes place to guarantee consistency with the OEF Guide and the latest version of the published guidance. It must include the definitions of the unit of analysis, allocation, calculation rules; and must guarantee that the data requirements are fulfilled and that the LCIA indicators (and any additional information) are appropriate. Both OEFSRs developed during the pilot phase are valid until 31 December 2020.⁸³ After the pilot phase, a transition phase has started for the 2018–2020 period. Modelling and testing will continue during the transition phase.⁸⁴

System boundaries

Organisations are linked to others through social, financial and physical relationships. In order to conduct an environmental footprint study, it is necessary to establish boundaries to restrict the number of examined relationships. In the OEF life cycle

⁸² EC, 2018b, pp. 33–39.

⁸³ EC, 2018b p. 40–42.

⁸⁴ EC, 2018a.

analyses, the resource use and emissions are linked to upstream and downstream processes. Upstream processes concern the products and services purchased by an organisation. Upstream processes consist of processes such as raw material extraction and transportation of purchased materials to a retailer. The downstream is the opposite side of a life cycle, including gate-to-grave processes linked to aspects such as distribution, storage, use and waste management.⁸⁵

System boundaries are highly important because they determine the utility of the analytical outcomes for specific applications. An analysis of the whole life cycle may identify whether upstream, downstream or on-site environmental impacts are dominant, and thus it may indicate towards opportunities to reduce the main impacts. The reduction may take place through redesigning products, changing the composition of the product portfolio⁸⁶ or making improvements to the supply chain, for example in the store or logistics.

2.2.5 Conducting an OEF study

The OEF Guide and OEFSRs provide specific technical instructions on how organisations can conduct an OEF study. This includes defining the goals and scope, assessing environmental impacts and the whole life cycle and processes related to them, as well as interpretation and reporting. The scope is determined in every OEFSR and expressed as a functional unit with a sector-specific function-based NACE code. This is further specified by defining the system boundaries (organisation and OEF boundaries) of the study (discussed in chapter 4.5). The studies further define the most relevant impact categories, life cycle stages, processes, and elementary flows of the examined organisation based on the product portfolio.⁸⁷ Definitions for each of the most relevant aspects are represented in the sub-chapter “Environmental aspects”.

Conducting an OEF study is an iterative process, which means that is necessary to perform a study several times before the ideal granularity of the product portfolio is reached. The product portfolio of the representative organisation and its most relevant environmental aspects may be used as examples for selecting the product groups within the portfolio.⁸⁸ The results of the OEF study are then interpreted with a special focus on those impact categories identified as the most relevant for the representative organisation and on life cycle stages that are specific for the organisation.⁸⁹

Companies can use the results of an OEF study to internally track their environmental performance. The results can be compared to target values, such as refrigerant loss values, kilometres driven per product, and energy consumption per square meter. In addition, in the case of retailers, they may assess and report the fraction of environmentally friendly products in the product groups of their portfolio. Here, environmentally friendly products

⁸⁵ Pelletier *et al.* 2014, p. 396.

⁸⁶ EC *et al.*, 2012, p. 23.

⁸⁷ EC *et al.*, 2012, p. 8, 15, 20–28, 91 and Quantis, 2018.

⁸⁸ Quantis, 2018, p. 26.

⁸⁹ Quantis, 2018, p. 80.

are considered to be products with a lower environmental footprint than the benchmark of that product category identified by the PEF.⁹⁰

The OEF has been developed alongside the PEF, and therefore, in theory, results of the OEF study should equal to the sum of all the PEFs for the goods and services provided by the organisation in the same reporting interval. However, in practise, the OEF does not require calculations of the environmental impacts for all of the products provided by an organisation. Instead, it uses aggregated data of resource flows and waste crossing the defined organisational boundary. The OEF indicates areas of the organisation's product portfolio with the most significant environmental impacts. For these, a detailed product-level analysis would be worth conducting.⁹¹

The requirements for the OEF study vary based on its application. For external communication purposes, the OEF study shall be verified and validated. This is done to provide assurance that the OEF study has been conducted in compliance with the OEFSR, and that the data and the information are reliable, credible and correct.⁹² If the OEF study is used for in-house applications then compliance with the present OEFSR is voluntary. However, it is mandatory if the results or any contents of an OEF study are intended to be communicated.⁹³

2.2.6 Data requirements

The data requirements vary depending on the relevance of the subject in question. An organisation must provide primary, directly collected or measured data whenever possible. The OEF aims to operationalise a "materiality" approach, which means focusing on the important matters which shape the environmental profile of an organisation. Thus, higher quality of data is required for the most relevant processes compared to less relevant contributors.⁹⁴ In addition, the OEFSR defines a mandatory, minimum list of requirements for which primary data shall be collected and guidance on how to assess the data quality.⁹⁵

The data quality requirements (DQR) are calculated based on four criteria: the technological-, geographical-, and time-representativeness and the precision/uncertainty. The representativeness factors characterise the degree the selected processes and products depict the analysed system. The precision indicates the data collection and related level of uncertainty. The DQR scores are set to be stricter for mandatory processes run by the company and looser for secondary datasets depicting other than most relevant environmental aspects.⁹⁶

⁹⁰ Quantis, 2018, pp. 80–81.

⁹¹ EC *et al.*, 2012 p. 9.

⁹² EC, 2018b, p. 138.

⁹³ EC, 2018b, p. 159.

⁹⁴ EC, 2018b, p. 127.

⁹⁵ EC, 2018b, p. 131.

⁹⁶ EC, 2018b, pp. 127–128, 134.

Secondary datasets to be used in OEF studies are available on a website⁹⁷ consisting of a large number of EF-compliant European-average datasets.⁹⁸ The OEFSRs define more specifically which default datasets are to be used for modelling, for instance, logistics, retail place, distribution, and support of retail sector.⁹⁹

2.2.7 *Communication of Organisation Environmental Footprint performance*

The result of an OEF study is called an “OEF Profile”. It must include at least the minimum requirements for primary, organisation-specific information defined in the OEFSR, if the profile is to be communicated. The OEF Profile may also include additional sector-specific environmental or technical information selected by the TS, if it is found to be relevant.¹⁰⁰

The means of communicating the OEF Profile depends on the target audience and the objective of the communication. The list of communication vehicles includes labels, environmental product declarations, websites, and infographics, for example.¹⁰¹ According to the European Commission (2016a, p. 66), the focus of the communication should be on the most relevant impact categories.¹⁰² For final products, at least three of the most relevant impact categories must be communicated. For intermediate products, all the most relevant identified impacts shall be communicated. These instructions apply to the pilot phase. In addition, results for all environmental impact categories shall be made publicly available.¹⁰³

The communication vehicles will be further tested by at least the companies that conducted OEF supporting studies. A study assessing the different possible communication vehicles was published in 2018.¹⁰⁴ The final communication vehicle will be proposed later.¹⁰⁵

⁹⁷ <http://lcdn.thinkstep.com/Node/>

⁹⁸ EC, 2018b, p. 137, 222.

⁹⁹ EC, 2018b, p. 137, 222 and Quantis, 2018, pp. 36–41.

¹⁰⁰ EC, 2018b, pp. 37–38.

¹⁰¹ EC, 2018b, pp. 16, 37–38.

¹⁰² EC, 2016a, p. 66.

¹⁰³ EC, 2018b, p. 37.

¹⁰⁴ See the final report on the assessment of different communication vehicles for providing Environmental Footprint information (2018) at http://ec.europa.eu/environment/eussd/smgp/pdf/2018_pilotphase_commreport.pdf

¹⁰⁵ EC, 2018b, pp. 37–38.

3. Grocery Stores and the Retail Sector in Swan and OEF Schemes

Both the Swan and the OEF have developed criteria/rules for stores. The Swan sets criteria requirements and awards points based on grocery stores' product range, energy consumption and waste. In the pilot phase of the OEF, the modelling is based on a virtual retailer operating in Europe and selling product groups varying from food to healthcare products and banking services. These product groups are illustrated by representative products to determine their average environmental impacts.

3.1 Introduction

Grocery stores and the retail sector, including the products they provide, have been objects of environmental performance tracking and ecolabelling. The stores generally use a lot of energy and they have an effect on both the local and the global environment over the life cycles of the products they sell.¹⁰⁶ The Nordic Swan Ecolabel for grocery stores aims to have a positive effect on environmental impacts related to retail by reducing the store's energy use, improving waste sorting and reducing waste volume, and increasing the availability and sale of ecolabelled and organic products.¹⁰⁷ Our study compares the approach of the Swan for grocery stores to the approach of the OEF retail scheme. These were chosen because they are the only organisational sectors that are comparable in the Swan and the OEF pilot.

This chapter focuses on the Swan and the OEF but there are multiple other schemes with existing or prepared criteria for retail. In the European context, the EU Ecolabel is planning on setting criteria for food retail stores.¹⁰⁸ The "SuperSmart" project for criteria development began in 2016 and proposed developing EU Ecolabel criteria for food retail stores in February 2019.¹⁰⁹ It assesses the criteria that should be applied to the food retail sector based on the current criteria and experience of existing ecolabelling schemes: the Nordic Swan Ecolabel, der Blaue Angel and Bra Miljöval.¹¹⁰ The Blue Angel (der Blaue Angel) is an official German ecolabel established in 1978 and has acted as the role model for the ISO 14024 standard. It assesses the life cycle impacts

¹⁰⁶ Nordic Ecolabelling, 2014, p. 5.

¹⁰⁷ Nordic Ecolabelling, 2016d, p. 1.

¹⁰⁸ SuperSmart, 2017.

¹⁰⁹ SuperSmart, 2019.

¹¹⁰ More information at: <http://www.supersmart-supermarket.info/>

of products and services to guarantee high environmental, health, and performance characteristics.¹¹¹

In the Nordic countries, there are multiple country-specific systems for stores and their products, especially in Sweden. Bra Miljöval, “Good Environmental Choice”, is a Type 1 ecolabelling system, which reviews the product range, energy use, waste production, transportation, environmental management, and the store’s own consumer goods.¹¹² Another system describing the environmental friendliness of a store in Sweden is KRAV, which requires a certain amount of KRAV-labelled food products and the promotion of organic products.¹¹³ KRAV-certification for a product indicates that the product is ecological, animal friendly, healthy, and socially responsible.¹¹⁴

Other schemes used to measure the environmental performance in the Nordic countries include: Miljøfyrtårn, and Grøn Butik. Miljøfyrtårn, the “Eco-lighthouse” is used in Norway to help small and medium-sized enterprises achieve environmental gains.¹¹⁵ A Danish system called Grøn Butik, “Green Shop”,¹¹⁶ requires the store to focus on at least three environmental and energy goals and participate in an environmental campaign.¹¹⁷

There are also other types of certificates available for retail stores. According to Nordic Ecolabelling (2014, p. 18), environmental management systems, such as EMAS and ISO 14024, are rarely used for grocery stores. To measure the environmental performance of the building itself, LEED and BREEAM have been set.¹¹⁸

3.2 Grocery stores in the Swan scheme

A Swan ecolabelled grocery store concentrates on the three most important issues from an environmental perspective related to its operations: product range, energy consumption, and waste.¹¹⁹ All of the three factors have a high overall RPS. According to Nordic Ecolabelling (2014, pp. 7–8), the product range is the most important factor because agriculture and industry have large environmental impacts related to the production of the products provided by grocery stores. Therefore, there is great potential for ecolabelled and organic products.¹²⁰ Organic products in the Swan ecolabelling scheme mean labels that are in accordance with the EU regulations (EC) No 834/2007 and (EU) No 203/2012, such as KRAV, Luomu, Debio, Ø-mærket and Tún-lífrænt. The criteria of the Swan for sustainable fishing approves the KRAV, Debio, and

¹¹¹ More information at: <https://www.blauer-engel.de>

¹¹² More information at: <https://www.naturskyddsforeningen.se/bra-miljoval>

¹¹³ More information at: <http://www.krav.se/>

¹¹⁴ Nordic Ecolabelling, 2014, pp. 17–18.

¹¹⁵ More information at: <http://www.miljofyrtarn.no/>

¹¹⁶ More information at: <http://intra.energitjenesten.dk.web7.redhost.dk/index.php?id=2343>

¹¹⁷ Nordic Ecolabelling, 2014, p. 17.

¹¹⁸ Nordic Ecolabelling, 2014, pp. 16–19.

¹¹⁹ Nordic Ecolabelling, 2016a, p. 4.

¹²⁰ Nordic Ecolabelling, 2014, pp. 7–8.

MSC certifications for fisheries.¹²¹ Stores' energy consumption is linked to the overall management and operation of the store as well as to the food. Energy consumption related to the use of lighting, ventilation, and refrigeration sets requirements on the amount of used energy, CO₂ emissions, and specific requirements for the equipment. Due to the importance of energy consumption, the stores performing well in energy efficiency are awarded a maximum of 20 points (out of a possible 63 points). Waste from stores is mainly generated from packaging, spoiled food, and the store's own operations. The Swan sets criteria for the volume of waste production and sorting.¹²² These and other Swan criteria are presented in Table 2.

To guarantee flexibility for the store to choose from among a variety of requirements, the Swan has 12 obligatory and seven-point score requirements for grocery stores (Table 2). All of the 12 obligatory requirements must be met. In addition, the applicant should score at least 23 points out of the possible 63 points from the seven-point score requirements.¹²³ The strictness of the criteria varies between the Nordic countries along with the present conditions and potential for achievements.¹²⁴ Icelandic stores are exempt from four of the 12 obligatory requirements because of the low supply of organic food and ecolabelled goods and services. These exceptions are the sale of organic food, ecolabelled consumables, ecolabelled durables, and ecolabelled consumables and services.¹²⁵

¹²¹ Nordic Ecolabelling, 2016a, p. 23.

¹²² Nordic Ecolabelling, 2014, pp. 7–8.

¹²³ Nordic Ecolabelling, 2017d, p. 8.

¹²⁴ Nordic Ecolabelling, 2014.

¹²⁵ Nordic Ecolabelling, 2017d, p. 8.

Table 2: The criteria in the Swan for grocery stores version 3.2. O stands for obligatory requirements and P for point score requirements

Aspects	Criteria
General	Groceries as a proportion of total sales (O1). Breadth of product range (O2).
Maintenance of the Nordic Swan Ecolabel licence	Maintaining the licence (O3). Responsible persons (O4).
Product range	Sale of organic food and drink, and products from sustainable fishing (O5). Higher sales of organic food and drink, and products from sustainable fishing (P1, max. 10 p). Sale of ecolabelled consumables (O6). Higher sales of ecolabelled consumables (P2, max. 10 p). Sale of ecolabelled durables (O7).
Energy	Energy efficiency (O8). Good energy efficiency (P3, max. 20 p).
Waste	General waste (O9). Little general waste (P4, max. 8 p). Waste sorting (P5, max. 2 p). Measuring visible food waste (O10). Measures to reduce food waste (P6, max. 10 p).
The store's use of goods and services	Ecolabelled consumables and services (O11). Higher purchase of ecolabelled consumables and services (P7, max. 3 p).
Overall	The store's points total (O12).

Source: Nordic Ecolabelling, 2017d.

The first Swan document for grocery stores was adopted in 2003. The current version 3.2 has been in effect since June 2016.¹²⁶ The Swan is popular in Sweden, as it had 162 stores with a valid license and 118 licenses in October 2018.¹²⁷ The number of licensed stores is greater than the number of licenses because of chain licenses, which contain multiple stores under one license.¹²⁸ There are no grocery stores with a valid license in other Nordic countries. The overall number of the Swan ecolabel certified stores has reduced between the criteria versions, especially between the first and the second.¹²⁹ According to Nordic Ecolabelling (2014, pp. 5–6), the specific reasons behind the decrease in the number of licensed grocery stores were tightened regulations, the administrative burden, and the lack of added value and competitive advantage of the ecolabel. The stores also felt that customers did not have enough information about ecolabelled stores and their significance.¹³⁰ A representative of Ecolabelling Sweden, Per Sandell, stated that the Swan acts more as an internal way of managing environmental issues and a benchmark for its operations than as a way to draw

¹²⁶ Nordic Ecolabelling 2014, p. 7 and Nordic Ecolabelling, 2017d.

¹²⁷ S. Wihlborg, personal communication, 8 October 2018.

¹²⁸ C. Karlsson, personal communication, 8 October 2018.

¹²⁹ Nordic Ecolabelling, 2014, pp. 5–6 and Nordic Ecolabelling, 2016a, p. 16.

¹³⁰ Nordic Ecolabelling, 2014, p. 5.

customers.¹³¹ The Swan has common features with environmental management systems, but at the same time, it sets strict requirements that distinguish it from EMSs. In addition, the Swan offers a way for the store to show the public that they are doing good work in environmental matters.¹³²

3.3 Organisation Environmental Footprint Sector Rules for Retail

3.3.1 Introduction

The Organisation Environmental Footprint pilot began in 2013 and was finalised by the end of 2018. Retail was one of the two pilots concerning organisations, the other being copper production.¹³³ The EC received a few proposals for the OEF pilots, and therefore two sectors were selected for conducting pilots.¹³⁴ According to Quantis (2016, p. 15), the coordinator of the OEFSR Retail pilot, the retail sector rules aim to foster the use of life cycle assessment in the “complex” retail world.

Retailers utilising the OEF method may operate with 1) the sale of products or 2) production and service provision of in-house products or 3) with both of them. The sale of products means retailing logistics including all activities necessary for buying and selling goods and services. The production and service provision of in-house products includes operations under the store’s financial or operational control. The OEFSR has been developed in the European context but can be used for business units and supply chains all over the world.¹³⁵

The Technical Secretariat (TS) directs the OEFSR development and three of its members have conducted screening studies to support the development process. The retail TS consists of 12 following organisations:

- Quantis: Coordinator of the pilot phase. An international research lab of Swiss origin guiding organisations with sustainability solutions;¹³⁶
- Carrefour*: International retail chain operating nearly 12,000 stores and 1,500 hypermarkets in more than 30 countries;¹³⁷
- Colruyt Group*: Belgian retail corporation managing the Colruyt supermarkets;¹³⁸
- Decathlon*: A French sports retailer selling over 35,000 products in more than 1,000 stores in 30 countries;¹³⁹

¹³¹ Phone interview conducted on 7 September 2017.

¹³² P. Sandell, personal communication, 7 September 2017.

¹³³ EC, 2017.

¹³⁴ A. de Schryver, personal communication, 11 September 2017.

¹³⁵ Quantis, 2018, pp. 20–21.

¹³⁶ More information at: <https://quantis-intl.com/>

¹³⁷ More information at: <http://www.carrefour.com>

¹³⁸ More information at: <https://www.colruytgroup.com/en/>

¹³⁹ More information at: <https://www.decathlon.co.uk/>

- Kering: Retailer of luxury fashion products such as Gucci and Alexander McQueen distributing to more than 140 countries;¹⁴⁰
- Office Depot Inc.: Number one reseller of workplace products and services in Europe;¹⁴¹
- Picard: Leading frozen food brand and retailer in France;¹⁴²
- French Technical Association of Trade and Retail (PERIFEM);
- French Environment and Energy Management Agency (ADEME);
- Environment Agency Austria (EAA);
- Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA);
- GLOBAL 2000 – Friends of the Earth Austria.

Three of the above (marked with * in the list above) are retailers that performed a supporting study.¹⁴³

3.3.2 *Virtual Retailer in the OEF Retail Screening Report*

A virtual retailer is an “average” representative organisation that does not exist in reality but acts as a point of comparison as described in the sub-chapter “Representative organisation and products”.¹⁴⁴ The representative organisation for the retail sector has been defined in collaboration the retailers belonging to the TS and concerning the key findings of a previous experience in the OEF.¹⁴⁵ The virtual retailer is described in the OEF Screening Report (2015).¹⁴⁶

The virtual retailer is assumed to be located in Europe. Therefore, the electricity data used is the average European electricity mix and the end-of-life data matches European averages of 27 EU member countries. The virtual retailer is defined by its products and services it provides and by its size. It has been assumed that the average retailer provides for 3,000,000 people, which defines the number for required in-house factories, distribution centres, retail places, and employees (Table 3).¹⁴⁷

¹⁴⁰ More information at: <http://www.kering.com/>

¹⁴¹ More information at: <http://www.officedepot.eu/>

¹⁴² More information at: <http://lioncapital.com/brands/#!picard>

¹⁴³ Quantis, 2018, p 17.

¹⁴⁴ EC, 2016a, p. 29 and EC, 2018b, p. 43.

¹⁴⁵ Colruyt Group, 2011, as cited in Quantis, 2015b, p. 13.

¹⁴⁶ Quantis, 2015b.

¹⁴⁷ Quantis, 2015b, pp. 13–14.

Table 3: Representative organisation characteristics

Characteristics	Amount
Consumers	3,000,000
In-house (own brands) factories	3
Distribution centres	10
Retail places	350
Total employees	39,700

Source: Quantis, 2015b, pp. 13–14.

The product portfolio of the virtual retailer is designed to represent many categories to act as an example to as many retailers looking for help as possible. It provides a full range of products for the 3,000,000 customers in one year. The amounts of sold products have been determined based on the literature and assumptions.¹⁴⁸

The representative products in the product portfolio are selected based on expert judgement to determine the most suitable products to illustrate each category and its environmental impacts. Typically, a representative product dominates the sales in a category. The choice also acknowledges the availability of data in the LCI databases.¹⁴⁹ The products included in the product portfolio of the virtual retailer and their representative products are presented in Table 4.

The estimations based on default data¹⁵⁰ composing the product portfolio concern the following:

- Share of consumers coming to the retailer and buying the specific product;
- Extent of food products and textiles as losses caused by the retailer or by the consumer;
- Quantity of the products consumed in a year per person;
- Where and how the products are transported to the factory, distribution centre, and retailer, taking into account the mass of the products transported and the distances between operators;
- Storage of the product (ambient, chilled, or frozen).¹⁵¹

¹⁴⁸ Quantis, 2015b, pp. 13–15.

¹⁴⁹ Quantis, 2018, p. 27.

¹⁵⁰ See Humbert and Guignard, 2015.

¹⁵¹ Quantis, 2015a.

Table 4: Product portfolio of the OEF virtual retailer

Retail trade sector	Category	Representative product	Amount sold by retailer/year	Amount offered for sale/year
Goods				
Food	Fruit and vegetables	Apples	402,390,000 kg	442,630,000 kg
		Meat and meat alternatives	20,790,000 kg	21,620,000 kg
		Beef (suckling beef, Brazil)	6,930,000 kg	7,210,000 kg
		Pork	80,670,000 kg	83,900,000 kg
		Poultry	51,950,000 kg	83,900,000 kg
		Sheep/Goat	5,000,000 kg	5,200,000 kg
		Fish	54,950,000 kg	57,150,000 kg
		Eggs	32,090,000 kg	33,370,000 kg
	Dairy	Milk	337,440,000 L	339,130,000 L
	Grain products	Pasta	246,380,000 kg	251,310,000 kg
	Oils and fats	Sunflower oil	30,740,000 L	31,050,000 L
	Prepared/processed meals	Frozen pizza	87,600,000 kg	87,600,000 kg
	Confectionery	Chocolate bar	16,430,000 kg	16,430,000 kg
	Other foods	Chips	27,380,000 kg	27,380,000 kg
Beverages	Alcoholic beverages	Beer	32,850,000 L	32,850,000 L
	Other beverages	Bottled water	109,500,000 L	109,500,000 L
Tobacco		Cigarettes	45,730,000 units	45,730,000 units
Pet food		Dog food	41,060,000 kg	41,060,000 kg
Live animals		Goldfish	40,000 units	40,000 units
Clothing and textile		T-shirts	15,000,000 units	16,500,000 units
Footwear and leather goods		Leather shoes	3,000,000 units	3,000,000 units
Personal accessories		Jewellery	750,000 units	750,000 units
Home and professional supplies	Home hardware supplies	Paint	1,500,000 kg	1,500,000 kg
	Furniture, furnishings and décor	Office chair	150,000 units	150,000 units
	Electrical household appliances	Refrigerator	600,000 units	600,000 units
	Kitchen merchandise	Plate	30,000,000 units	30,000,000 units
	Information and communication equipment	Cell phone	1,500,000 units	1,500,000 units
	Office machinery and supplies	Toner cartridge	1,500,000 units	1,500,000 units
Cultural and recreational goods	Books, newspapers and paper/paper supplies	Printing paper	1,500,000 kg	1,500,000 kg
	Music and videos	DVD	6,000,000 units	6,000,000 units
	Sporting equipment and gadgets	Play ball	3,600,000 units	3,600,000 units
	Other cultural and recreational goods	Toy	9,000,000 units	9,000,000 units
Healthcare		Aspirin	6,000,000 units	6,000,000 units
Cleaning/hygiene products, cosmetics and toiletries		Laundry detergent	13,500,000 kg	13,500,000 kg

Retail trade sector	Category	Representative product	Amount sold by retailer/year	Amount offered for sale/year
Fuels, gases, lubricants and oils		Automotive oil	900,000 L	900,000 L
Batteries and power		Battery	7,500,000 units	7,500,000 units
Plants and garden supplies	Flowers, plants and seeds	Roses	900,000 units	900,000 units
	Other garden supplies	Fertilizers	600,000 kg	600,000 kg
Other goods		Reusable shopping bag	9,000,000 units	9,000,000 units
Services				
Gas station	Gas station infrastructure	Gas station	100 units	100 units
	Gas station products	Gasoline	540,000,000 L	540,000,000 L
Printing services	Printing services infrastructure	Printing centre	100 units	100 units
	Printing services products	Paper	150,000 kg	150,000 kg
Banking services		ATM	200 units	200 units
Real estate		Commercial space rented	100,000 m ² ·year	100,000 m ² ·year
Rental services		Utility vehicle	15,000 unit·days	15,000 unit·days

Source: Quantis, 2015b, p. 16.

There are some losses caused by the retailer and the consumer, which is the reason why the product portfolio presented in Table 4 has a larger amount offered for sale than the actual sales. Food loss is defined in the OEF context as something that could have been eaten but was discarded. Waste includes everything that is a loss, such as a banana that could have been eaten including its peel, and items that are not considered a loss but were thrown away, such as the peel of a banana. In real OEF studies, loss rates caused by the retailer are evaluated with primary data for the specific organisation, and losses by consumers are set in default use stage datasets.¹⁵²

The loss rates for the virtual retailer are evaluated based on the datasets prepared by Quantis.¹⁵³ The loss rates for food have been set according to the data provided by the FAO in 2011.¹⁵⁴ Quantis has estimated the loss rates for other categories, such as clothing, pet food, and flowers.¹⁵⁵ In the OEF Screening report (2015, pp. 14–15) the loss shares by the retailer and consumer were considered to be:

- fruits and vegetables: 10% by the retailer and 19 % by the consumer
- meat and meat alternatives: 4% and 11%
- dairy products: 0.5% and 7%
- grain products: 2% and 25%

¹⁵² Quantis 2015b, pp. 12, 15.

¹⁵³ Quantis 2015b.

¹⁵⁴ FAO. 2011, as cited in Humbert and Guignard 2015.

¹⁵⁵ Humbert and Guignard 2015.

- oil and fat: 1% and 4%
- In the screening report, a 10% loss of clothing and textiles are assumed to be due to the retailer.¹⁵⁶

The system boundaries of the virtual retailer include the complete life cycle of the sold products: production and service provision, logistics, retail place, distribution, use, end-of-life, and support stages. The acknowledged elements of the life cycle are shown in Table 5. Inventory that is not sold within the one year of examination should also be included in the OEF study.¹⁵⁷

Table 5: Elements and definitions considered for the life cycle stages associated with the product portfolio of the OEF virtual retailer

Life cycle stage	Elements
Production and service provision (of all representative products of the product portfolio)	Raw material production, delivery of product and packaging. Product and packaging manufacturing. In-house factories: employees related activities.
Logistics (from factory to distribution centres, the distribution centres, and from distribution centres to retail places)	Transport by truck, train, ship or plane; at ambient, chilled or frozen temperatures. Distribution centres (infrastructure [building], equipment and machinery production, energy and water consumption, and refrigerant gas leakage). Employee-related activities at transportation and distribution centres.
Retail place (shopping malls, shops, tele and e-commerce, self-pick-up places)	Infrastructure and equipment (building, fridges and freezers, shelves, carts, IT equipment). Energy consumption and refrigerant gas leakage. Water consumption. Repackaging (plastic production and treatment). Treatment of retail losses. Other services at the retail place (e.g. gas station, printing or banking).
Distribution of products to the clients (performed by retailer and by client)	Transport from the retail place to the home (by consumers by car, by delivery when done by retailer). Distribution related activities.
Use (downstream impacts of materials, energy and emissions associated with goods/services)	Full life cycle of appliances used (incl. manufacturing, energy and water use, and refrigerant gas leakage) e.g. fridges, stoves, washing machines, printers. Treatment of consumer losses.
End-of-life (treatment of products and their packages)	Plastic bags for waste collection and treatment. Transport to place of treatment (from home to collection place and from collection to treatment place). End-of-life treatment of products and packaging: recycling, incineration and landfilling depending on material.
Support	Administration, financial services and purchased units, R&D, IT, quality, technical and design aspects, marketing, sustainability, customer support. Employee-related activities (commuting, business travels, canteen and sanitary water).

Source: Quantis, 2015b, pp. 11–12; Quantis, 2018, pp. 22, 58–79.

¹⁵⁶ Quantis, 2015b, pp. 14–15.

¹⁵⁷ Quantis, 2018, p. 22.

The validity of the virtual retailer has been set against data collected by the retailers that were part of the TS. The data collected from the literature and the assumptions that were used in forming the product portfolio have been compared with the data of real-life retailers. The review indicated that the data was in the same range with the data of TS members.¹⁵⁸

¹⁵⁸ Quantis, 2015b, p. 17.

4. Comparison

Comparison of the two schemes shows that both aim to steer the market towards more sustainable consumption and production but by different means. The Swan informs customers with a label and benchmarks grocery stores. The OEF aims to develop a harmonized method for assessing environmental aspects and providing data for retailers. The Swan applies an analysis of the relevance, potential and steerability of the environmental issues. The OEF assesses such aspects for the whole life cycle of products of a virtual retailer. Despite differences, the schemes recognize fairly similar environmental aspects relevant for stores, such as climate change and resource use. The relevant life cycle stages mainly differ due to exclusions in the methods. Both schemes act more as internal tools for retailers than for communication purposes, wherefore they can be considered environmental management systems.

4.1 Introduction

This section aims to illustrate some of the similarities and differences in the analytical approaches of the Nordic Swan Ecolabelling and the OEF Pilot scheme. The focus is on the criteria award documents of the Swan for the grocery stores and the OEF Sector Rules for retailers. The comparative sectors have been chosen because retail and grocery stores are the only sector that exists in both of the schemes. There are, however, some significant differences in the scope, method, and environmental information used in the schemes. By comparing the core methodological questions, we illustrate how the differences appear in practice. Thus, we can determine how the two systems could complement each other.

It should be acknowledged that the comparison has been made between the environmental information on the OEF virtual retailer in the EU market and the criteria document of the Swan which has been set for the Nordic market. In addition, as the comparison in this chapter indicates, the nature of stores differs significantly between the schemes. The objects of comparison we have focused on are: the functional unit, system boundaries, the most relevant environmental impacts and life cycle stages. These aspects are not represented directly, but their characteristics can be found in the criteria document of the Swan and its background document on grocery stores. We have interpreted these in order to compare the Swan with the OEF.

4.2 Goals

To begin the comparison, it is important to recognise how different the goals of the Swan and the OEF are, although both aim at steering the market towards sustainable production and consumption. The Swan aims to reduce the environmental impacts and to gain benefits by ecolabelling the best performing products or organisations. The Swan informs customers and helps them to make an environmentally better choice between products and services. At the same time, it tells retailers and manufacturers whether the product/organisation is performing well in environmental and ethical terms.¹⁵⁹ In the OEF, the goal is to establish a common method for measuring the environmental performance throughout the life cycle of an organisation and the products it provides. It aims to create a clear, reliable, and comparable means of communication and to increase the availability of data concerning environmental performance. The OEF measures the overall life cycle impacts of the products provided by a store including the retail place operations to indicate hotspots,¹⁶⁰ whereas the Swan drives the retailer to perform better by setting requirements on the hotspots for its own functions, such as energy consumption, waste production and range of goods, which the stores can influence.¹⁶¹

4.3 Functional Units

A functional unit, or the unit of analysis or the reporting unit as termed in the OEF documents, means the definition of an organisation. It includes the name of the organisation, determination of the sector of goods and services it produces, location of operations, and the NACE codes.¹⁶²

The functional unit is not defined by using the term “functional unit” in the Swan documents concerning grocery stores. Yet there are specific requirements concerning the limitations for a store that can apply for the ecolabel and which indicate the functional unit. A store where groceries make up over 50% of the sales can apply for the Swan. In the Swan ecolabelling context, groceries are goods that are expected to be consumed or used within a limited period. This includes food, drinks, and consumables. Consumables are everyday groceries other than food or drink, such as diapers, books, and batteries. The Swan also has criteria for durables, which are supposed to last a longer period and cannot be included in the previously mentioned groceries. These include, for example, furniture, toys, and clothes.¹⁶³

¹⁵⁹ Nordic Ecolabelling, 2017c.

¹⁶⁰ EC, 2013; EC, 2016c.

¹⁶¹ E. Magnus, personal communication, 15 September 2017.

¹⁶² EC *et al.*, 2012, p. 91.

¹⁶³ Nordic Ecolabelling, 2017d.

A grocery store in the Swan ecolabelling scheme may be a single store, part of a chain, part of a group, or an Internet store.¹⁶⁴ In addition, wholesalers may apply.¹⁶⁵ Retail chains are defined as stores sharing the same concept/name/brand that, in its marketing, differentiates itself from other kinds of store partnerships. All the stores must be located in the Nordic region. Individual stores in a chain are supposed to have a partnership in purchasing, as well as a joint agreement with the other chain members to comply with the requirements of Nordic Ecolabelling, and joint registration of data concerning the criteria. If over 90% of the stores in a chain satisfy the requirements, the chain is included in the license. When fewer than 90% of the chain stores meet the criteria, only those individual stores complying may be marked with the Swan Ecolabel, not the chain. In addition, a group of stores in partnership in purchasing, and with a joint agreement on compliance with the Swan requirements, and joint registration of data, may apply for a license. However, they cannot promote themselves as a Swan Ecolabelled chain, but as an individual Swan Ecolabelled store. Online stores with several locations for warehousing and picking of goods can apply as a chain. Online stores that use subcontractors for warehousing and the picking of goods may apply for their own Nordic Ecolabel, if the subcontractor is ecolabelled.¹⁶⁶

In the OEF, the reporting unit is a retailer, classified as a product provider, over a one-year time interval.¹⁶⁷ The OEFSR Guidance document states that the reporting unit is parallel to the concept of a functional unit in a traditional LCA. It is applicable for all kinds of retailers, such as independent stores, chains, franchisers that are selling food, fast-moving consumer goods, durable goods, consumables or services.¹⁶⁸ The OEF retailers are mainly part of NACE code number 47 “retail trade”,¹⁶⁹ which includes:

“the resale of new and used goods mainly to the general public for personal or household consumption or utilisation, by shops, department stores, stalls, mail-order houses, door-to-door salespersons, hawkers, consumer cooperatives etc.”¹⁷⁰

The OEF unit of analysis includes all life cycle impacts of the products that the retailer provides, the impacts of their entire storage period and impacts of products available in the inventory but not sold within one year. The scope shall also include all the activities of a retailer even if some activities are not related to retailing as such.¹⁷¹

¹⁶⁴ Nordic Ecolabelling, 2017d p. 4.

¹⁶⁵ Nordic Ecolabelling, 2016a, p. 4.

¹⁶⁶ Nordic Ecolabelling, 2017d, pp. 4–5.

¹⁶⁷ Quantis, 2018, pp. 24, 43.

¹⁶⁸ Quantis, 2018, p. 21.

¹⁶⁹ Except of motor vehicles and motorcycles (Quantis, 2018, p. 21).

¹⁷⁰ Quantis, 2016, p. 59.

¹⁷¹ Quantis, 2018, p. 24.

4.4 Reference Flow

A reference flow is a quantified measure of the functional unit. It defines the total amount of products provided by an organisation during the reporting interval. The reference flow examines the outputs from processes in a given system required to fulfil the function expressed by the unit of analysis.¹⁷² Output is described as a product, material, or energy flow leaving the unit process.¹⁷³

In the Swan, the reference flow is not clearly defined using the term “reference flow”. However, features of a reference flow can be found. It can be seen in the amounts of products sold in stores and in the shares of ecolabelled and organic products, and waste generation. The sorts of products that a store must sell are listed in the “breadth of a product group” criterion, which is fulfilled if the retailer sells products in at least 10 out of 18 product groups (Appendix II). The product range has to meet the country-specific criteria either concerning the proportions of organic and ecolabelled sales, their sales in local currency, or the number of ecolabelled products for sale. The Swan uses sales in local currency as the measure of the reference flow due to its high availability.¹⁷⁴ The Swan products regarding the criteria for the breadth and sales are presented in Table 7 together with the reference flows of the OEF.

Waste produced in a store comes primarily from product packaging, damaged consumables, and food waste, which relates to the products offered for sale. Especially food waste, due to spoilage, occurs because the stores order more than they sell due to a feeling that the store must have large quantities on display to promote sales, or they may have an unnecessarily large range of products, or oversized packs of products received from their wholesalers.¹⁷⁵ The amount of general waste is measured in kilograms of waste over the total sales of the store in millions in the local currency. In addition, the store may choose how it measures visible food waste. The options include: the quantity in kilograms, the purchase value and lost sales in crowns or EUR.¹⁷⁶

In the OEF, a retailer-specific product portfolio describes the reference flow of an organisation.¹⁷⁷ The product portfolio includes:

“the products (goods and services) provided for sale (both in-house products (i.e., products that are manufactured or significantly transformed by the retailer) and other products (i.e., own brands that are not manufactured nor significantly transformed by the retailer, as well as national and international brands).”¹⁷⁸

The product portfolio defines the products perceived in the OEF environmental impact calculations and represents the amount and nature of the goods during a one-year interval in order to answer questions “what” and “how much” as presented in Table 6.

¹⁷² Pelletier *et al.*, 2014, p. 393.

¹⁷³ ISO, 2006.

¹⁷⁴ Nordic Ecolabelling, 2017d, p. 9–17.

¹⁷⁵ Nordic Ecolabelling, 2016a, p. 12.

¹⁷⁶ Nordic Ecolabelling, 2017d, pp. 20–21.

¹⁷⁷ EC, 2018b, p. 43.

¹⁷⁸ Quantis, 2018, p. 24.

The amount of each product category is expressed in a unit that avoids misunderstanding, such as kilograms per year. According to Quantis (2016, p. 55), reference flows are ideally measured in quantities, but as the screening study by Carrefour indicated, financial data is sometimes more readily available and in that case it should be used to estimate quantities if no better data is available. Therefore, expert judgement should be used to assess the typical unit of mass of one unit, e.g. the typical weight of apples per one EUR of apples sold or weight of one t-shirt.¹⁷⁹

Table 6: Example of an OEF reference flow/product portfolio concerning the clothing and textile category

Aspect	Detail
What?	T-shirts (average for size S, M, L) made from polyester, trousers (average for size S, M, L) made from polyester.
How much?	40,000 T-shirts, 20,000 trousers.
How well?	Wear once per week and use washing machine at 30 degrees for cleaning once weekly, the energy use of the washing machine equals 0.72 MJ/kg clothing and the water use is 10 litres/kg clothing for one wash cycle. One T-shirt weighs 0.16 kg and one pair of trousers weighs 0.53 kg. This results in an energy use of 0.4968 MJ/week and a water consumption of 6.9 litres/week.
How long?	Use stage of five years for both the T-shirts and the trousers.
Year	2010.
Reporting interval	One year.

Source: EC *et al.*, 2012, p. 23.

The product portfolio is represented by product categories. The minimum number of product categories required to capture the whole product portfolio depends on the goal of the study and the product portfolio subject to the OEF study. According to the OEFSR Retail criteria, the study should follow the list of major retail trade sectors. These sectors form the basis for the OEF Retail product portfolio categories and are presented in Table 7.¹⁸⁰

¹⁷⁹ Quantis, 2018, p. 26.

¹⁸⁰ Quantis, 2018, p. 24.

Table 7: Reference flows

OEF Retail		Swan Grocery stores
1	Food	Preserved foods Children's food Frozen foods Sandwich toppings Dairy Snacks Ice cream and frozen berries
2	Beverages	Drinks Coffee, tea, drinking chocolate
3	Tobacco	Not included
4	Fruit and vegetables	Fruit and vegetables
5	Meat and meat products	Meat – fresh/preserved, ready-made food
6	Fish, crustaceans and molluscs	Fish – fresh/preserved, ready-made food
7	Bread, cakes, flour and sugar confectionery	Bread and baked goods Grains and baking ingredients
8	Automotive fuel	
9	Information and communication equipment: computers, peripheral units and software telecommunications equipment audio and video equipment	TVs, PCs, monitors and printers
10	Textiles	Towels and bed linen
11	Hardware, paints and glass	Paints
12	Carpets, rugs, wall and floor coverings	Flooring
13	Electrical household appliances	Not included
14	Furniture, lighting equipment	Furniture, outdoor furniture, outdoor play equipment, stoves, degreasers, car care products and washer fluid Lighting
15	Cultural and recreation goods: books, newspapers and stationary, music and video recordings, sporting equipment, games and toys	Paper products (e.g. notebooks, printing papers, and envelopes) Sketchbooks, books, wrapping paper, adhesives, pens, hobby paints, watercolours, fingerpaints, and crayons Toys
16	Clothing	Clothes
17	Footwear and leather goods	Footwear
18	Dispensing chemist	Not included
19	Medical and orthopaedic goods	Not included
20	Cosmetic and toilet articles	Toiletries Hygiene consumables (e.g. cosmetics, cotton, shampoo) Children and babies' consumables such as hair and mouth care products
21	Flowers, plants, seeds, fertilisers, pet animals and pet food	Green consumables (flowers, plants and flower soil) Animal feed

	OEF Retail	Swan Grocery stores
22	Watches and jewellery	Not included
23	Cleaning products	Laundry, washing-up, and cleaning chemicals and equipment for cleaning Household chemicals
24	Other (representative product is a reusable shopping bag)	Bags and boxes Disposables Candles Other consumables (e.g. charcoal, barbeque briquettes, batteries)
25	Services (e.g. printing, banking, real estate, car washing, gas station)	Not included

Note: The OEF data concerns the product portfolio represented in the OEFSR Retail (2018, pp. 24–25). For the Swan, the reference flow includes products mentioned in the criteria “breadth of product groups”, “sale of ecolabelled durables”, and in the list of goods considered to be consumables (Appendix II) in the Nordic Ecolabelling for Grocery stores Version 3.2 (2017). There are other durables that can be ecolabelled and are taken into account in the Swan but the requirement for groceries making at least 50% of the sales must be met. See all the product groups that can be Swan ecolabelled at <http://www.nordic-ecolabel.org/criteria/product-groups/>

4.5 System boundaries

System boundaries for the Nordic Swan Ecolabel are not outlined in the documents. However, the background document for grocery store criteria shows which functions in the sector fulfil the requirements for relevance, potential and steerability. A broad scope is used during the development of the criteria to find the most relevant environmental aspects. The scope is often narrowed in the existing criteria due to low relevance, potential, or steerability.¹⁸¹ Only those sectors with a high or medium RPS are included in the examination. The product range, waste generation, energy use, and consumables and services purchased by the store are evaluated to have a high or medium RPS for grocery stores. Transportation, water use, and packaging are priority areas, which are generally considered to be important in relation to environmental impacts but were excluded from the Swan due to their low RPS.¹⁸² All low RPS elements have been left out in order to reduce the work and documentation load during the application phase.¹⁸³

The system boundary of the Swan consists thereby of at least the store itself due to the use energy and waste production criteria, and some of the upstream and downstream impacts related to the product range and purchases made by the store. Since the criteria aim to encourage increased production and sales of ecolabelled and organic products with fewer life cycle environmental impacts and better longevity, the

¹⁸¹ E. Magnus, personal communication, 15 September 2017.

¹⁸² Nordic Ecolabelling, 2016a, pp. 8–9.

¹⁸³ Nordic Ecolabelling, 2016a, p. 18.

ecolabel influences the production stage and reduces the waste production at the end-of-life stage.¹⁸⁴

There are two type of system boundaries in the OEF: organisational and OEF boundaries. The organisational boundaries in the OEF approach may be determined based on three approaches. A “control approach” includes two separate control courses: (1) financial and (2) operational. Financial control means the functions that the organisation fully or partially owns, and the operational control concerns the direct operational influence over facilities. A third approach, known as the “equity share”, is founded on activities with an ownership share, and only impacts in relation to the extent of the share are taken into account.¹⁸⁵ The EC (2012, p. 24) emphasizes that the control approach is better suited for environmental performance measurement and management and it ensures maximally representative models.¹⁸⁶ If all sites involved in the provision of the product portfolio are owned and controlled by the organisation, there is no difference in results between the three approaches. However, in the equity share approach, the organisation is responsible for the impacts from units according to the share of ownership, while under the control approaches the organisation accounts for 100% of the units.¹⁸⁷ Thus, the operational control approach should be used.¹⁸⁸ This is due to the greater potential to implement management changes when the organisation has a direct influence, whether financial or operational, over the facilities and all the operations within the organisational boundary. These facilities and operations are expected to provide primary data.¹⁸⁹

According to Pelletier *et al.* (2013, pp. 396–397) organisational boundaries may not provide a sufficient and broad enough insight into an organisation’s environmental impacts. A life-cycle-based analysis demands an expanded definition of the system boundaries consisting of all relevant supply chain stages. It should also include the indirect impacts occurring upstream or downstream along the supply chain, which are left out of the organisational boundaries.¹⁹⁰ The boundaries of the organisation environmental footprint have therefore been set. The OEF boundaries include all upstream and downstream processes connected to the organisation’s product portfolio. A life cycle assessment requires cradle-to-grave environmental accountancy, which might not be feasible. For instance, the use and end of life stages of an intermediate product may be beyond of the organisation’s reach. In that case, the downstream processes may be excluded from the analysis.¹⁹¹

¹⁸⁴ Nordic Ecolabelling, 2016a.

¹⁸⁵ Quantis, 2018, p. 29.

¹⁸⁶ EC *et al.*, 2012, p. 24.

¹⁸⁷ Martinez-Blanco *et al.*, 2015.

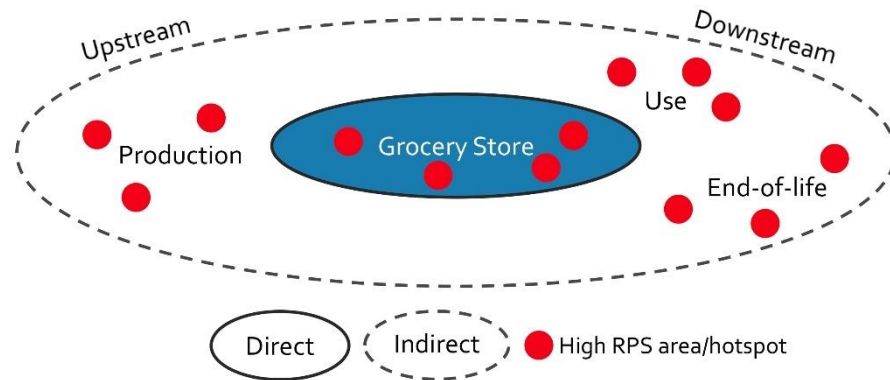
¹⁸⁸ Quantis, 2018, p. 29.

¹⁸⁹ Pelletier *et al.*, 2014.

¹⁹⁰ EC *et al.*, 2012, pp. 25–26.

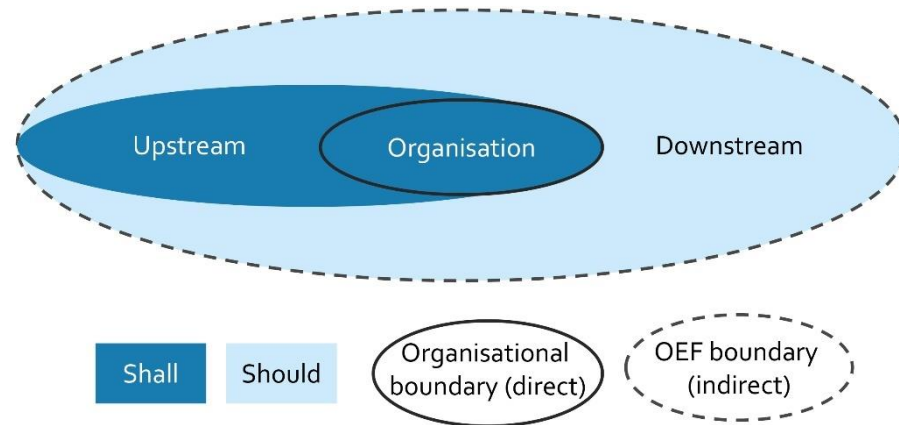
¹⁹¹ Pelletier *et al.*, 2014, pp. 396–397.

Figure 3: A schematic representation of the system boundary of a Swan grocery store



Note: Direct impacts concern on-site impacts and indirect ones are related to products. The number of hotspots in the figure do not correspond directly to the number of criteria or their importance. Note that the system boundaries are sector specific, and this system boundary applies only to grocery stores.

Figure 4: Organisational and OEF boundaries in the OEF Guide (2012)



Note: Note that the boundaries depicted here are the "default" system boundaries, which are similar between sectors. Each retailer has its own system boundary defined in the OEF study, which shall comply with the default one.

Adapted from European Commission, Joint Research Centre & Institute for Environment and Sustainability, 2012.

4.6 The Most Relevant Identified Environmental Impact Categories

Many issues need to be taken into consideration when comparing the most relevant environmental impact categories between the schemes. First, the OEF evaluates 16 default environmental impact categories, while the Swan does not have a predefined list of impacts, but sets the criteria based on a relevance assessment analysis of environmental aspects. Secondly, the OEFSR Retail scheme does not evaluate toxicity-related impact categories during the pilot and transition phases, which might affect the formation of the most relevant environmental impact categories. Thirdly, like the other objects of comparison, the most relevant impact categories have not been defined for grocery stores in the Swan. Therefore, the results represented in this chapter are only interpretations based on the available documents.

The Swan sets measurable criteria based on an analysis of the relevant environmental aspects concerning grocery stores. To compare the most relevant environmental impacts, we have interpreted the environmental aspects mentioned in the background document of the criteria for grocery stores and its RPS analysis. The analysis indicates the most important environmental issues, called “hotspots”.¹⁹² In general, the hotspots include the choice of raw materials, use of hazardous chemicals, use of energy and resources, emissions to all kind of recipients, health aspects, noise and waste treatment associated with production, transport and final disposal.¹⁹³

The most relevant impact categories of the Swan can be construed as the impacts related to high RPS areas: product range, energy, and waste. As the “breadth of product range” criteria consists of 18 categories, 14 of which are food products, the product range impacts are assessed as the ones related to food (Appendix II). Nordic Ecolabelling (2016a, p. 8) has identified hotspots linked to the life cycle of the food being the most important source of negative environmental impacts in human life, which the store provides.¹⁹⁴ These impacts are greenhouse gas emissions, use of land and resources, water consumption, threats to biodiversity, and environmental toxins.¹⁹⁵

Energy consumption is the second area with a high overall RPS. The energy consumption of a Swan Ecolabelled store is mainly due to electricity used for fridges and freezers. Thus, the impacts related to electricity have been evaluated in this section. The electricity use depends mainly on the number and type of electric devices, such as freezers and fridges, used in the store.¹⁹⁶ The Swan does not weigh up different energy types against each other but focuses on the energy efficiency of the store.¹⁹⁷ The main environmental impact that energy efficiency relates to is climate change.¹⁹⁸

¹⁹² NCM, 2014.

¹⁹³ NCM, 2014 p. 3.

¹⁹⁴ EC, 2006, as cited in Nordic Ecolabelling, 2016a, p. 8.

¹⁹⁵ Nordic Ecolabelling, 2016a, pp. 8, 42.

¹⁹⁶ Nordic Ecolabelling, 2016a, pp. 34–36.

¹⁹⁷ Nordic Ecolabelling, 2016a, p. 42.

¹⁹⁸ Nordic Ecolabelling, 2014, pp. 7–8.

The third area with a high RPS is waste production, including plastics, glass and metal, wood, and organic waste. The Swan sets requirements on the waste amounts and gives points for good sorting and reduction of food waste. The Swan highlights the importance of food waste as an important factor in achieving a sustainable society. The environmental impacts related to food waste are considered to be similar to the impacts of food in the “breadth of product range” requirement.¹⁹⁹ All of the most relevant evaluated environmental impacts related to the three high RPS areas are presented in Table 8.

The Swan in general takes into consideration the impact of chemicals on human health and the environment, working conditions, and the social effects.²⁰⁰ The two latter are not mentioned however in Table 8 of the most relevant environmental impacts of the Swan and the OEF as they are not environmental impacts, though they are otherwise important issues.

In the OEF, the most relevant impact categories are the ones cumulatively contributing over 80% to the overall impacts of the retailer. These have been calculated for the virtual retailer in the OEF screening report. In addition, the TS has included biodiversity as a relevant impact category in the context of retailers, although it is not included in the list of the 16 impact categories of the OEFSR. Retailers shall report the information concerning their impacts on biodiversity under the section of additional environmental information in the OEF study. The most relevant impact categories were:

- Climate change
- Ozone depletion
- Particulate matter
- Acidification
- Eutrophication, terrestrial
- Land use
- Resource use, fossil
- Biodiversity.²⁰¹

However, it should be noted that due to possibly large variability in the product portfolio of a retailer, the production, use, and end-of-life stages have been excluded from the analysis. Therefore, particulate matter, terrestrial eutrophication, and land use have been left out of the list of the most relevant impact categories of retail sector.²⁰² In addition, the three impact categories related to toxicity (human non-

¹⁹⁹ Nordic Ecolabelling, 2016a, pp. 42–52.

²⁰⁰ NCM, 2014 and E. Magnus, personal communication, 15 September 2017.

²⁰¹ Quantis, 2018, pp. 33, 79–80.

²⁰² Quantis, 2018, p.33.

cancer, human cancer, and ecotoxicity) have not been included in the pilot phase to wait for the results of ongoing work to develop characterisation factors.²⁰³

The final five most relevant impact categories of the OEFSR Retail scheme are presented in Table 8 together with the hotspots of the Swan. These results are valid only for the virtual retailer with a certain product portfolio and the identification of the categories shall be carried out individually for every store.²⁰⁴ Therefore, the comparison between the most relevant impact categories of the OEF Retail and the Nordic Swan Ecolabel presented in Table 8 is not exhaustive.

Table 8: Environmental impact categories

OEFSR	Swan Criteria Document
Climate change and ozone depletion	Climate change and greenhouse gas emissions
(Land use)	Land use
Resource use, fossil	Use of resources
Biodiversity*	Threats to biodiversity
Acidification	
(Eutrophication, terrestrial)	
(Particulate matter)	
	Environmental toxins
	Water consumption
	Human health

Note: In the OEF, these are the “most relevant” in the OEFSR for a virtual retailer. For the Swan, they include the “hotspots” mentioned in the Swan Background Criteria Document and comments from Elisabeth Magnus. Categories are not directly comparable due to different approaches of the schemes. The parentheses implicate impacts related to the excluded lifecycle stages (production, use, and end-of-life).

* Biodiversity has been added by the TS.

4.7 Life Cycle Stages

The life cycle stages examined in the Swan could be defined in a MECO analysis. However, there is no MECO analysis performed for grocery stores. Therefore, like with other objects of comparison, we have interpreted the life cycle stages based on the Swan criteria for grocery stores and its background document. As the Swan follows the ISO 14024 standard on Type 1 ecolabels, the life cycle stages assessed by the Swan are considered to be the ones mentioned in the standard. These are production (extraction of resources and manufacturing), use, distribution, and disposal.²⁰⁵ However, distribution has been excluded from the Swan due to its low RPS.²⁰⁶ To support and complement the stages mentioned in the ISO 14024 standard, we have looked through the Swan background document for grocery stores. In that document, the retail place stands out in the focus of the criteria as the energy consumption and waste production

²⁰³ EC, 2018b.

²⁰⁴ Quantis, 2015b, p. 72 and EC, 2018b, pp. 32, 34.

²⁰⁵ ISO, 2018.

²⁰⁶ Nordic Ecolabelling, 2016a, pp. 8–9.

on site are assessed as high RPS areas. In addition, the selection of ecolabelled and organic products can be seen to steer both the production and the use stage towards sustainability, and thus these stages are included.²⁰⁷ Ecolabelled products, with high functionality and longevity, are expected to reduce the amounts of waste production as well.²⁰⁸ Thus, the Swan for grocery stores considers production, the retail place, use, and end-of-life stages.

In the OEF scheme, the life cycle stages are defined specifically in accordance with the OEF and organisational system boundaries or the retailer. According to Quantis (2018, p. 29), the operational control approach for the organisational boundaries would include logistics, the retail place, support, and part of the distribution stage. Some retailers may also have part of the production and service provision stage under their control. The use and end-of-life stages are typically not under the control of the retailer, though in some cases the retailer may collect back products and packages it has sold, adding those stages to those included within the retailer's system boundaries.²⁰⁹ The definitions and elements of the life cycle stages used in the OEF are presented in Table 5.

The most relevant life cycle stages in the OEF are determined to comprise at least 80% of the environmental impacts of the retailer. The production and use stage of the products sold by the virtual retailer stand out from others according to Quantis (2015, p. 70). The impacts related to the production stage are mainly from food products, especially animal related products. During the use stage, products that require high levels of energy and water consumption have the greatest impacts. Durables and products emitting "polluting" substances also contribute a lot during the use stage. After the production and use stages, the next greatest stages in accordance with their environmental impacts are logistics, due to transport and fuel consumption, and the retail places using a lot of energy. The use of energy in retail places strongly reflects the use of fridges and freezers used for storage. However, due to possibly large variability in the product portfolios of different retailers, the production, use, and end-of-life stages have been excluded from the OEF analysis.²¹⁰ The most relevant life cycle stages of the OEF virtual retailer along with the life cycle stages related to high RPS areas in the Swan for grocery stores are presented in Table 9.²¹¹

²⁰⁷ Nordic Ecolabelling, 2016a, p. 29.

²⁰⁸ Motiva Services Oy – Ympäristömerkintä, 2017c.

²⁰⁹ Quantis, 2018, pp. 29–30.

²¹⁰ Quantis, 2018, p. 33.

²¹¹ Quantis, 2015b, pp. 70–71 and Quantis, 2018, p. 33.

Table 9: The most relevant life cycle stages considered in the OEF virtual retailer compared to the high RPS areas of the Swan based on the OEFSR for Retail and the criteria background document for grocery stores

	OEFSR	Swan Criteria Document
Production	(x)	x
Logistics	x	
Retail place	x	x
Distribution of products to the clients	x	
Use	(x)	x
End-of-life		x
Support	x	

Note: The stages in parentheses have been excluded for the OEF of the virtual retailer because of large variability. The life cycle stages are not directly comparable due to different approaches of the schemes.

4.8 Environmental Management Systems

Both of the schemes are more useful for improving the company's own operations than acting as a consumer communication tool, therefore, it is more meaningful to compare them as environmental management systems (EMS). The Swan acts as a benchmark of a store's environmental performance, and the store can easily monitor the consequences of its operations and choices concerning the areas of high overall RPS. The Swan ecolabel also indicates whether the store steers consumers to choose environmentally wisely and strives to reduce its own impacts related to energy use, product consumption, and waste production.²¹² The OEF, on the other hand, indicates the overall life cycle impacts of the products that the store provides to the market. The store receives information on the environmental sustainability of its product portfolio.²¹³

The current Swan criteria version 3.2 for grocery stores does not require the use of an ISO 14001 or EMAS based environmental management system (EMS). The previous versions set requirements on environmental management but most of them were deleted in the current version due to lack of functionality. In many cases, the requirement was seen as a source of greater bureaucracy without achieving actual environmental gains.²¹⁴

Key requirements for ensuring compliance with the requirements kept in the current Swan criteria concern annual reporting; a responsible person who takes care of the license; and a contact person who communicates with the Nordic Ecolabelling organisation. The licensees are liable to meet the Swan requirements throughout the entire validity period of the license. Therefore, annual audits are performed in the licensed businesses to verify their compliance with the Swan criteria. The audits take place according to the Nordic Ecolabelling electronic application guide. If the organisation does

²¹² Nordic Ecolabelling, 2016a.

²¹³ Quantis, 2018.

²¹⁴ Nordic Ecolabelling, 2016a, p. 60.

not meet the criteria, it has the opportunity to rectify the deviation within a given deadline and in case it does not, Nordic Ecolabelling may withdraw the license. In addition, a responsible person must be nominated to document and carry out the annual reporting. In addition, a contact person must be nominated to act as a communication bridge between the store and the Nordic Ecolabelling. The person responsible for the license and the contact person may be the same person or separate employees.²¹⁵

The OEF is aligned with the existing environmental management systems ISO 14001 and EMAS. This means that the schemes should be alike, though the OEF Guide is always the determining one in the OEF studies.²¹⁶ According to Pelletier *et al.* (2013, p. 387), a harmonised method for measuring an organisation's environmental footprint should provide for a multi-criteria, life-cycle-based approach that considers all organisational and related activities across the supply chain, provides for reproducibility and comparability over flexibility, and ensures physically realistic modelling. These criteria cannot be fulfilled with the current EMSs.²¹⁷ Whereas the EMSs have been utilized in framing the OEF, according to Quantis (2018, p. 81), it also works the other way around as EMSs can use OEF. Here, the information gained in the OEF for retail can be used as a part of internal information, improvement tracking and management systems, as well as for external corporate social responsibility reporting and ISO 14001 certification.

²¹⁵ Nordic Ecolabelling, 2016a, pp. 22–23.

²¹⁶ EC *et al.*, 2012.

²¹⁷ Pelletier *et al.*, 2014, p. 387.

5. Discussion

This part of the report discusses the differences and similarities of the Swan and the OEF and assesses their relevance and function for different stakeholders. The Swan indicates stores with a relatively low environmental impact, whereas retailers with a low OEF value are expected to sell products with a low product environmental footprint. The range of products may vary more in the OEF with the Swan focusing on food, consumables and durables. They both focus on areas that they can affect related to a store and products it provides. From a retailers point of view they both act as an EMS and a way of recognizing hotspots to affect by selecting products with a lower environmental impact. The main points of the chapter are collected and presented in Table 10.

5.1 Introduction

A special focus has been given to the results of our comparison as well as the reports “Swan Background document” (2016), “Evaluation of the Swan for grocery stores” (2014), “OEF retail screening report” (2016) and the outcomes of the supporting studies are presented in the draft OEFSR Retail (2016) document. These documents encase experiences of the stores that have or have had the Swan license or have taken part in the TS of the OEF. Observations on the schemes have been aggregated in Table 10.

5.2 Basis

The Swan highlights the stores that are doing the best in terms of the environmental aspects accounted for in the Swan criteria. It grants a license according to ISO 14020 and 14024 standards to a store that has a broad range of products, including a certain minimum number of ecolabelled foods, drinks, consumables, and durables. The store shall also have good energy efficiency and a low level of waste production. The Swan guarantees that the store has lower environmental impacts than others due to a large selection and sales of ecolabelled and organic products, and by minimizing the store’s own consumption of energy.²¹⁸ The Swan ecolabel for grocery stores can be seen as an environmental management system or a benchmark to track the store’s environmental performance.²¹⁹

If a retailer has a low OEF value, this indicates that it sells products with relatively low PEF value among the product categories included in the OEFSR. The OEF does not

²¹⁸ Nordic Ecolabelling, 2016a.

²¹⁹ P. Sandell, personal communication, 7 September 2017.

however guarantee that the store is “among the best environmentally performers”. Instead, it shows that the store provides products and services that have a certain level of environmental impacts over their life cycles from the producer to the user with a store being one of the transitory stages. In the OEF, the impacts of products are calculated based on classification (in categories) and generalisation (with representative products) to evaluate the environmental impacts of an individual store. The OEF includes the whole life cycle of products and services, i.e. the production, marketing, use, and end of life, as specified in ISO 14040 and 14044. The functions taking place in all of the treatment places and in transportation are taken into account. The information gained from the PEFs on the products provided by the store is used to evaluate the environmental soundness of a store. The PEF includes information concerning the life cycle of a product with the store as one of the stages but does not especially focus on the store’s operations to the same extent that the Swan does. The OEF cannot be used in comparative assertions between retailers, but it can point out hotspots and problematic areas within the organisation. After identification of hotspots, these aspects can be worked with and thereby environmental burdens related to them may decline. A store can, for example, stop selling a product with a high environmental burden or replace it with another type of a similar product, such as an ecolabelled one, and thereby put pressure on the producer to manufacture environmentally sound products.²²⁰

5.3 Functional Unit, Reference Flow and System Boundary

The functional units of the Swan and the OEF are partly the same, but the Swan focuses on groceries whereas a retailer in the OEF scheme may sell a broader scope of goods as long as they are mainly sold to the public. The functional unit of the Swan grocery store is defined as a store, retail chain, wholesaler, or an online store with sales made up to at least 50% of groceries meaning food, drinks, and consumables.²²¹ In the OEF, the functional unit is a retailer as a product provider over a one-year time interval. This applies for all kinds of retailers, such as independent stores, chains, and franchises, that are selling food, fast-moving consumer goods, durable goods, consumables, or services. It applies to retailers mainly operating under the NACE code number 47, which means the resale of new and used goods mainly to the general public for personal or household consumption or utilisation.²²²

There are some similarities and differences between the reference flows of the Swan and the OEF. The product categories included in the analysis, presented in Table 7, concern mostly similar products. Overall, the OEF encompasses a larger variation of goods, for example jewellery, and does not focus only on groceries. In addition, some of the categories, such as medicines and tobacco, included in the OEF

²²⁰ Quantis, 2018.

²²¹ Nordic Ecolabelling, 2017d.

²²² Quantis, 2018, pp. 21, 24.

are not observed in the Swan due to their low RPS. Another difference in the reference flows is the approach to measuring the products. The Swan uses shares of sales, the number of products available and sales in local currency. The OEF measures the quantitative amounts produced and eventually consumed based on sales and losses occurring at the retailer and consumer, together with the environmental impacts of the processes falling on each product.²²³

Both of the schemes deal with impacts, life cycle stages and processes, with which it can make a difference, and which are therefore included within the system boundaries. The Swan takes more specific aspects into account when observing an organisation, whereas in the OEF the framework is larger and can be seen as more theoretical. The RPS analysis creates the basis in formulating the system boundaries of the Swan grocery stores. Only those characteristics that have a high overall RPS matter when awarding a store with the license. The OEF focuses on relationships that concern the product portfolio of the organisation in question. This considers all operations operated or owned by the retailer (organisational boundaries) throughout the whole life cycle (if possible) of a product, including the store itself and its energy consumption, as one life cycle stage. Along with the organisational boundaries, the impacts of the upstream activities, such as raw materials purchased from a manufacturer, shall be included. Downstream impacts should be included if possible.

Both of the schemes focus on the organisation itself but consider some upstream and downstream impacts as well. The OEF Study shall include all upstream impacts and some downstream ones if possible. Regarding the upstream and downstream impacts, the Swan is more specific and includes only the aspects related to production and use of goods and waste production. The difference in these approaches becomes concrete in the example of transportation. This has been excluded from the Swan due to its low steerability, even though its relevance and potential are medium or high. At the same time, the OEF shall include the distribution between the producer, distribution centres, and retail place and should take into account the transportation from the retailer to consumer.

5.4 Most Relevant Environmental Aspects and Life Cycle Stages

The most relevant environmental aspects are similar to some extent, but also represent major differences between the OEF and the Swan. They both evaluate stores on aspects which contribute significantly to climate change, resource use, and which threaten biodiversity. However, biodiversity is not included in the default set of environmental impact categories in the OEF, but the sector-specific TS has assessed it as relevant for the retail sector. Both schemes would also include land use as one of the most relevant impact categories, but due to exclusion of the production, use, and end-

²²³ Nordic Ecolabelling, 2017d and Quantis, 2018.

of-life stages from the OEF analysis,²²⁴ land use is not considered relevant for the virtual retailer representing the whole retail sector. Also eutrophication and particulate matter would be on the list of the most relevant impact categories in the OEF, but are left out due to the exclusions, and are neither evaluated as hotspots in the Swan. Acidification is considered important in the OEF, while in the Swan it is not. Another clear difference is that the Swan finds water consumption relevant, while the OEF does not. Lastly, the Swan includes environmental toxins and human health as its hotspots. However, similar toxicity categories related to environment and human health have been excluded from the OEF during the pilot phase because their calculation methodology is still under development.²²⁵

The comparison of the most relevant life cycle stages in both approaches indicates great similarities and differences at the same time. The most relevant life cycle stage common in both the OEF and the Swan is the retail place itself. This is because the production, use, and end-of-life stages are excluded from the virtual retailer in the OEF.²²⁶ Without the exclusion, production and use would be included as the most relevant life cycle stages as they are in the Swan. Thus, the OEF and the Swan would have three most relevant life cycle stages in common. A difference between the approaches is that even without the exclusion, the end-of-life stage is not considered relevant in the OEF, while in the Swan it is. Another difference is that the OEF considers both logistics and distribution of products to clients to be important, whereas they are excluded from the Swan due to their low RPS. In addition, the support stage is included as one of the most relevant life cycle stage for the virtual retailer. Finally, to conclude the differences, the OEF takes account of a broader selection of the most relevant life cycle stages for its virtual retailer. However, it excludes production and use stages that are considered important in the Swan. In the end, the final most relevant life cycle stages are therefore quite different between the schemes.²²⁷

5.5 Actor Perspectives on the Schemes

5.5.1 Retailer Perspective

From a retailer's point of view, both schemes act more as environmental management systems than as a way of external communication and gaining added value in the market.²²⁸ Therefore, the original goals of the schemes, presented in Table 10, have not yet fully been met. By applying for the Swan, the retailer shows willingness to provide better products in terms of their environmental performance and quality for its

²²⁴ Production, use, and end-of-life stages have been excluded from the analysis of the most relevant impact categories and processes of the virtual retailer. This decision has been made due to possibly large variations in the product portfolios of retailers (Quantis, 2018, p. 33).

²²⁵ Nordic Ecolabelling, 2017d and Quantis, 2018.

²²⁶ Quantis, 2018, p. 33.

²²⁷ Nordic Ecolabelling, 2017d and Quantis, 2018.

²²⁸ P. Sandell, personal communication, 7 September 2017; A. de Schryver, personal communication, 11 September 2017.

customers. The store also strives to reduce its own environmental burden in terms of hotspots related to the sector: energy and waste. The OEF too acts, to the best of our knowledge, as a voluntary system for measuring the life cycle impacts of the products provided by a store. As opposed to the Swan, the OEF does not have a special focus on the store's operations or set any requirements for performance levels. Therefore, it could be easier for the store to adopt, but on the other hand, it does not indicate good performance externally as the Swan does.

The use of the Swan and the OEF benefits the retailer in many ways. By using the Swan, retailers can benchmark their environmental performance compared to other stores operating in the Nordic market and show customers their good environmental performance compared to a non-labelled store. This could bring profit to the retailer as the ecolabel is seen as an important aspect when selecting a store by approximately one fifth of survey respondents in Sweden.²²⁹ The OEF is expected to offer a harmonised method for retailers to measure their environmental impacts and to reduce the costs related to having multiple schemes in different markets. The retailer can conduct only the OEF study and have the opportunity to enter the entire EU market by fulfilling only one scheme of requirements, which has not been possible with the current schemes.²³⁰

Both schemes require resources from the retailer. Lots of information must be collected before applying for the Swan and changes to, for example, energy use and other facility management may be needed. To reduce the workload, the Swan concentrates on the most relevant aspects based on the RPS analysis. The Swan also requires retailers to nominate a responsible person to ensure that the Swan requirements are met throughout the validity period of the license and take care that the annual audits are conducted. One employee also needs to be responsible for being in contact with the Nordic Ecolabelling organisation.²³¹ The Nordic Ecolabelling organisation collects fees from the applicants, and therefore, in order to have a positive balance, the stores need to gain an economic advantage from using the label.²³² Most of the burden related to adopting the OEF was in the screening studies related to data provision because the OEF requires data concerning a broad range of products and ideally their life cycles from cradle-to-grave. Thus, it necessitates a lot of time and work, though the OEF is meant to reduce the burdens through harmonisation.²³³

5.5.2 *Producer Perspective*

The impacts of a retailer mostly relate to the production stage, which in general are beyond the control of the retailer.²³⁴ Therefore, the producer is a relevant actor in the life cycle impacts of the retailer. The retailers may use both the OEF and the Swan in B2B communication and involve their suppliers in the retailer's sustainability policy. The

²²⁹ Demoskop, 2014, as cited in Nordic Ecolabelling, 2014, p. 12.

²³⁰ Chomkhamsri and Pelletier, 2011, p. 58 and EC *et al.*, 2012, pp. 8–12.

²³¹ Nordic Ecolabelling, 2016a, pp. 22–23.

²³² Nordic Ecolabelling, 2014.

²³³ Quantis, 2016, pp. 54–55.

²³⁴ Quantis, 2018, p. 29.

Swan covers indirect impacts in the production stage by providing ecolabelled and organic products. As a Swan ecolabelled store favours products produced with lower environmental impacts than other products in the same product group, producers are encouraged or pushed to produce goods fulfilling the set requirements of organic and ecolabels. In the OEF, a retailer gets information on the hotspots of its supply chain and can select suppliers that offer products with lower environmental impacts. Thus, it can promote the design and manufacture of products with lower environmental impacts.²³⁵

5.5.3 Consumer Perspective

It could be stated that from a consumer's point of view, it is important that the store provides "green" products, but ecolabelling a store or measuring its own performance is not a prerequisite. Ecolabels are seen as relatively important factors in consumer decision making, as shown in surveys conducted by YouGov (2015) and Ipsos (2017). In both surveys, a quarter of the respondents always looked or often looked for an ecolabel when buying a product.²³⁶ A survey conducted by Demoskop supports this view and found that one fifth of Swedish customers found the Swan Ecolabel of a store a significant aspect when choosing where to do their grocery shopping.²³⁷ However, some of the Swan licensed stores have felt that the ecolabel does not attract customers or bring added value.²³⁸ According to Nordic Ecolabelling (2014, p. 5) the stores feel that often the consumers do not know what a Swan Ecolabelled store stands for.

The results of an OEF Study in the retail sector are compiled into an OEF Profile. A verified OEF Profile may be communicated externally by using a vehicle selected during the transition phase. The vehicle may be, for example, a label, website, or infographic. The results for all environmental impact categories shall be publicly available.²³⁹ However, according to a representative of the European Commission, OEF Retail does not work for consumer communication, and therefore it remains an internal and B2B means of communication. The OEF is not expected to be visible to consumers and therefore does not attract them.²⁴⁰

²³⁵ Quantis, 2016, p. 54.

²³⁶ YouGov, 2015 and Ipsos, 2017, as cited in K. Bergbom, personal communication, 25 October 2017.

²³⁷ Demoskop, 2014, as cited in Nordic Ecolabelling, 2014, p. 12.

²³⁸ Nordic Ecolabelling, 2014, pp. 14–15.

²³⁹ EC, 2018b, pp. 16, 37–38.

²⁴⁰ A. de Schryver, personal communication, 11 September 2017.

Table 10: Comparison of the schemes

	OEFSR Retail	Swan for grocery stores
Goal	Reduce the environmental impacts. Establish a harmonised method for measuring life cycle impacts in the EU. Create a substantive technical guidance Indicate hotspots of the supply chain Produce free high-quality data on life cycle impacts. Create a clear and comparable way of communicating environmental performance.	Reduce the environmental impacts. Gain environmental benefit by ecolabelling the best performing products and services in the national markets of the Nordic countries. Help consumers make better environmental choices among a product group. Drive stores to perform better by setting requirements on the store's own functions.
Methodology	Virtual retailer illustrating an average retailer in the EU market. Product portfolio comprising all product groups provided by a retailer. Representative products used for estimating average impacts of a product category. Defines the most relevant aspects (impacts, life cycle stages, processes, and elementary flows) that contribute cumulatively over 80% to the environmental impacts.	Assesses relevant environmental aspects based on preliminary studies. Generally uses a MECO analysis. Selects the areas of the requirements based on an RPS analysis, i.e. where environmental gains can be achieved in today's market.
Functional unit	A retailer, as a product provider, over a one-year time interval, that typically meets the NACE code 47.	A store or a retail chain with groceries making up at least 50% of the sales.
Reference flow	Product portfolio which may include a large variety of products: e.g. food, pets, jewellery. Answers questions "what, how much, how well and for how long". Quantity of goods measured in a unit that avoids misunderstanding. Usually kilograms/year.	Mainly food products in addition to other groceries. Amount of products measured in sales in local currency. Waste measured in kilograms over total sales.
System boundary	1. "Organisation boundary", i.e. facilities that are operationally or financially controlled by the retailer; and 2. "OEF boundary", i.e. all the relevant indirect life cycle impacts related to the product portfolio occurring upstream and (when feasible) downstream.	Includes only aspects with a high overall RPS. The store itself and life cycle stages related to the requirement of ecolabelled and organic products the store provides.
Impact categories	16 default impact categories assessed (currently excluding toxicity). TS may select additional environmental impact categories. Most relevant impact categories are the ones contributing cumulatively over 80% to the overall impacts.	Does not have a predefined list of environmental impacts. The most relevant impact categories are the ones related to the high RPS areas.
Data	Data requirements vary based on the relevance of the subject. Primary data is required to be used for modelling the most important aspects. The OEFSR defines a minimum list of processes that require the use of primary data. EF-compliant secondary datasets for modelling other aspects are provided on a website.*	Primary data is required for all functions and products of the store which are covered in the criteria. Only in exceptional cases secondary data as a part of the documentation is permitted.

	OEFSR Retail	Swan for grocery stores
Other issues	The OEFSR Guidance and OEFSR Retail will be revised according to the experiences gained during the pilot phase. Does not enable comparative assertions between retailers.	Promotes development by tightening the requirements at least every 5 years. Awards points for better performance with certain flexibility. Focuses on aspects where gains can be achieved. Takes other than environmental issues into account when relevant e.g. working conditions.
Benchmarking	Benchmarking has been withdrawn from the final OEFSR Guidance version 6.3.	The label sets a benchmark and aims to license the best performing 30% of products of the product group.
Communication	OEF Profile. Options for communication vehicle are being tested during the transition phase (2018–2020). No consumer communication.	Ecolabel on a product/service indicates the best performing product/service in the category. Names of the ecolabelled products are available online.

Note: * <http://lcdn.thinkstep.com/Node/>

6. Conclusions and Recommendations

Both the Swan and the OEF concern stores and products provided by them in order to push the market towards more sustainable production and consumption but with different approaches. The Swan aims to make stores perform better and help consumers to tell environmentally best operators apart, whereas the OEF creates a common methodology for sector-specific life cycle assessments. The Swan has a multi-criteria system to award the best performing stores on the grounds of the store's energy efficiency, waste production and use of ecolabelled products and services, and for the sales of ecolabelled and organic goods to consumers. These aspects are assessed to have high relevance, potential and steerability (RPS), making them essential and responsive to the Swan. The OEF assesses the life cycles of a store's individual product portfolio, which includes all the product groups that the store provides. A representative product is chosen for each product group to depict the average environmental impacts of the group. Compared to the Swan, the store in the OEF is one operator in the life cycle of the product, rather than a subject of examination.

The comparison of the two schemes and their environmental information revealed concrete differences. The definition of the functional unit that the criteria and rules concern, in the Swan grocery stores involve selling mainly food and in the OEF retailers there are broad varieties of products ranging from food to pets and jewellery. The relationships between the actors taken into consideration are defined in the system boundaries, which are broad but technically well defined in the OEF and narrower in the Swan. The Swan criteria include only areas with high overall RPS, which are the product range, energy consumption, and waste production of a store. The OEF takes into consideration the organisation and at least the upstream impacts of the products provided, and the downstream impacts of certain products. The reference flows of the stores are measured in the Swan by using shares of sales, the number of products available and sales in the local currency. The OEF measures the quantitative amounts produced and eventually consumed based on sales and losses occurring at the retailer and consumer, together with the environmental impacts of each representative product.

The comparison of the most relevant environmental aspects considered in the Swan and in the OEF indicated some major differences. It should be noted that the aspects are not completely comparable due to different approaches. Both methods view climate change, resource use, and biodiversity as the hotspots or the most relevant impact categories for the retail sector. The production, use, and end-of-life stages have been chosen by the EC to be excluded from the analysis of the virtual retailer. This decision affects the most relevant defined impact categories, as land use, eutrophication, and particulate matter are therefore excluded from the list of the most

relevant impacts. Land use is the only impact category that has also been found as a hotspot in the Swan. Other differences include the importance of acidification in the OEF and water consumption in the Swan. Finally, the Swan considers environmental toxins and human health as hotspots, while in the OEF, the similar toxicity categories related to environment and humans have been excluded in the pilot phase.

The OEF is perceived to have a broader scope regarding the most relevant life cycle stages. It has identified six most relevant life cycle stages out of seven stages for its virtual retailer, while the Swan has only four. The same stages in both schemes are production, retail place, and use. However, the production and use stages have been excluded from the OEF analysis because of the large variability possible in the product portfolios in the retail sector. Apart from the exclusion, the biggest difference between the most relevant life cycle stages of the schemes is that the OEF considers logistics and distribution relevant. These two have been left out of the Swan due to their low RPS. In addition, the support stage is considered relevant in the OEF and the end-of-life stage in the Swan.

Both schemes act as environmental management systems for the stores to monitor their environmental performance and to identify hotspots within their scope and have effects on the store's own operations. They are useful tools depending on the goals of the store. With the Swan, the store is able to benchmark whether it fulfils the set criteria and is among the best performing 30% of the stores in the Nordic market. The OEF aims to integrate the requirements and data used for marketing "green" products. This harmonisation ensures a lower threshold for stores to apply and use ecolabels in the EU market. Retailers also have an influence on producers. This affects the producers by encouraging the stores to choose to provide products with a lower environmental burden.

Regarding the use of the OEF or Swan in marketing a retail company or grocery store, the Swan ecolabelled stores hold a license and have the opportunity to market themselves as ecolabelled stores. A survey conducted by Demoskop (2014) indicated that 20% of Swedish consumers found the ecolabel to be an important factor when choosing a store.²⁴¹ However, at the same time, the Swan licensed stores have experienced that the label has not worked as a means to attract consumers. The OEF is not going to be communicated with a consumer labelling approach and therefore it remains an internal environmental performance measurer and a tool in B2B marketing and information exchange.

The OEF Retail scheme does not enable comparison for consumers. However, it provides a harmonised methodology and a lot of useful environmental information about products and services for all sorts of ecolabels and environmental management systems. Harmonised information can also help other schemes (such as Type 1 ecolabels) to develop similar criteria based on identified hotspots of each sector.

We identified possible synergies between the Swan and the OEF:

²⁴¹ Demoskop, 2014, as cited in Nordic Ecolabelling, 2014, p. 12.

- To use the OEF in the Swan criteria setting process:
 - The Swan could consider setting criteria based on an OEFSR for grocery stores;
 - The OEF identifies sector-specific hotspots, which could then be assessed with the RPS tool, in order to reduce the workload;
 - The Swan could have a point score requirement to reward companies that have conducted an OEF Study;
 - The Swan could aim at reducing stores' environmental impacts by awarding stores for cutting down the amount of or replacing products with a high environmental burden indicated in the OEF.
- To use the OEF as a measure in the Swan:
 - The OEF could benefit the Swan by using representative products, product groups and their PEF values as measures of the overall life cycle impacts of the products provided by the store, which the sale of ecolabelled and organic products only partially reflects.
- Taking the geographical context of organisations into account when using the OEF default data to assess environmental impacts, in which the local ecolabelling schemes, such as the Swan could help.
- To use the Swan as a communication tool for the OEF:
 - The OEF for retail is best suited as an environmental performance tracker and a management system within an organisation, and another way of communicating the environmental performance to consumers is evidently needed. It could take place through ecolabels such as the Swan. However, in this case further synergies should be built between the two systems.

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Sammanfattning

Organisationers miljöavtryck (Organisation Environmental Footprint, OEF) är ett initiativ från EU-kommissionen som syftar till att etablera och testa en allmän metod för att beräkna och meddela miljöprestanda för en organisation och dess produkter i ett livscykelperspektiv. OEF:s eventuella roll som ett extra politiskt instrument på den europeiska marknaden som kan ändra bruket av befintliga verktyg, inklusive miljömärken, avgörs senare av EU-kommissionen.

I denna studie behandlas OEF-metoden och jämförs med det nordiska miljömärket Svanen. Fokus ligger på den information som används och produceras inom livsmedelsaffärer och detaljhandelssektorn i de två systemen. I studien undersöks den slutliga versionen och utkast av pilotfasen av OEF, och både Svanens offentligt tillgängliga, slutliga dokument och interna rapporter. Rapporten syftar till att reda ut hur de två systemen kan jämföras med tanke på deras mål, metodiska tillvägagångssätt, resultat och kommunikation till allmänheten för att identifiera olikheter och likheter samt eventuella synergier mellan dem.

Bestämmelserna för organisationers miljöavtryck (OEFSR-regler) tillhandahåller sektorspecifik vägledning för att utföra en OEF-studie. Vägledningen representerar objektiva tekniska instruktioner för bedömning av miljöpåverkan från organisationernas produkter ur ett livscykelperspektiv. OEFSR-vägledningsdokument utgör en ram för förfaranden för att identifiera de mest relevanta påverkningskategorierna, livscykelstadierna, processerna och de elementära strömmarna inom livscyklerna. Resultatet är en "OEF-profil" av vilken organisationens miljöprestanda framgår. Olika interna och externa kommunikationsmedel testas av Europeiska kommissionen medan denna rapport skrivs.

Det nordiska miljömärket Svanen grundades 1989 och är väl känt bland tillverkare och konsumenter i de nordiska länderna. Systemet beviljar en licens för produkter och organisationer med bästa prestationsnivån inom sin egen kategori. Den nordiska miljömärkningsnämnden bestämmer prestationsnivån som indikerar "bäst inom sin kategori" och ställer upp kriterier på miniminivå för organisationer. Kriterierna bedöms enligt RPS-modellen, (R) för "relevans" (P) för potential och (S) för styrbarhet för att bestämma vilka aspekter som är väsentliga inom sektorn och var miljöförmåner kan nås genom att introducera Svanen. Miljöaspekter, hälsoaspekter och sociala aspekter med den högsta miljöpåverkan, dvs. hotspots bedöms ofta med en metod som kallas "MECO" (material, energi, kemikalier och övrigt).

För att beskriva likheter och olikheter mellan resultaten av systemen, jämförde vi OEFSR-reglerna inom detaljhandel och kriterierna för det nordiska miljömärket Svanen inom livsmedelsaffärer, eftersom det är den enda sektor där vägledning etablerats inom båda systemen. Man bör observera att resultaten inte kan jämföras helt på grund av olika metodologiska tillvägagångssätt. OEF använder en LCA-baserad (baserad på

livscykelanalys) beräkningsmetod för 16 miljöpåverkanskategorier. Svanens kriterium är baserat på befintliga livscykelanalyser för att fastställa miljöaspekter, men med större flexibilitet än OEF. Svanen beaktar även icke kvantifierbar information och högklassig expertisbedömning av kriteriet samt hälsoaspekter och sociala aspekter.

Båda systemen strävar efter en mer hållbar konsumtion och produktion, men tillvägagångssätten är olika. Svanen mål är att uppmuntra affärerna att prestera bättre och att hjälpa konsumenterna att fatta miljövänliga beslut, emedan OEF strävar efter att skapa en gemensam metod och göra det möjligt att använda högkvalitativa öppna data i samband med beräkningar av miljöprestanda. Svanen beviljar licens i huvudsak till livsmedelsaffärer, emedan detaljhandlare med ett bredare produktsortiment, såsom mat, sällskapsdjur och bensin kan använda OEF. Svanen fokuserar på hotspots relaterade till affärens verksamhet och produktutbud, emedan OEF fäster vikt vid processerna och platserna som detaljhandlaren ansvarar för samt påverkan uppströms och nedströms i anslutning till de produkter som detaljhandlaren tillhandahåller.

Jämförelsen i denna rapport indikerar att den information om miljön som de båda systemen tillhandahåller är olika. Miljöpåverkansgrupperna inom Svanens kriterium är något olika dem som OEFSR-reglerna evaluerar som "mest relevanta" miljöpåverkanskategorier gällande detaljhandel. Båda anser fyra allmänna aspekter vara viktiga, men om tre påverkanskategorier har de delad åsikt. Skillnaden mellan de mest relevanta påverkanskategorierna beror på olika synpunkter på viktiga livscykelstadier, då Svanen ställer krav endast på stadier med hög övergripande RPS, som delvis gäller skilda stadier än OEF. Undantag har gjorts i fråga om livscykelperspektiv gällande OEF för den virtuella detaljhandlaren som har använts som grund för att identifiera de mest relevanta miljöaspekterna. Undantagen ökar skillnaderna mellan de två systemen.

I denna rapport identifierade vi eventuella synergier mellan Svanen och OEF. Synergierna gäller tre viktiga faktorer: uppställning av kriterier, beräkning och kommunikation:

- Svanen kan tänka sig att sätta upp kriterier baserade på befintliga OEF gällande detaljhandel eller baserade på en ny studie om organisationers miljöpåverkan gällande livsmedelsaffärer. OEFSR-reglerna kunde användas för att identifiera miljöhotspots så att Svanen kan fastställa sin inriktning. Svanen kunde tilldela utmärkelser till butiker som höjer sin försäljning av produkter med sådan hög negativ miljöpåverkan som anges i OEF.
- Svanen kunde i sin kriterieuppsättning använda OEF för att identifiera vilken miljöpåverkan en butik och dess tillhandahållna varor har.
- Lokala miljömärkningssystem såsom Svanen kunde hjälpa OEF att beakta organisationers geografiska sammanhang i samband med tillämpning av standard data.
- Miljömärken såsom Svanen kan användas för att informera konsumenterna om de affärer som bäst uppfyller kraven enligt OEF.

Appendix I

OEF default organizational impact categories (OEFSR Guidance version 6.3 May 2018):

- Climate change
- Ozone depletion
- Ecotoxicity – fresh water
- Human toxicity – cancer effects
- Human toxicity – non-cancer effects
- Particulate matter – impact on human health
- Ionising radiation – human health effect
- Photochemical Ozone Formation
- Acidification
- Eutrophication – terrestrial
- Eutrophication – fresh water
- Eutrophication – marine
- Resource use – minerals and metals
- Resource use – fossils
- Water use
- Land use

Appendix II

Table 11: Breadth of product range criteria in the Swan

Product categories	
1	Fruit and vegetables incl. fresh herbs and spices
2	Meat and fish – fresh/preserved
3	Sandwich toppings
4	Dairy
5	Bread and baked goods
6	Drinks
7	Coffee, tea, drinking chocolate
8	Preserved foods in jars, tins and boxes, oil, herbs and spices, stock and dry semi-finished products
9	Children's food incl. porridge, gruel, snacks and drinks
10	Grains and baking ingredients
11	Snacks
12	Frozen foods
13	Ice cream and frozen berries
14	Animal feed
15	Paper products
16	Kitchen paper, toilet paper, tissues, serviettes, candles, baking paper, muffin cases, coffee filters
17	Household chemicals
18	Toiletries

Source: Nordic Ecolabelling, 2017d, pp. 9–10.



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Nordic Swan Ecolabel and Organisation Environmental Footprint

The Organisation Environmental Footprint (OEF) initiative of the European Commission and the Nordic Swan Ecolabel both aim at more sustainable consumption and production. We compared the two schemes in relation to their environmental information concerning the retail sector. The Swan aims to push stores to perform better and to help customers make environmental choices, whereas the OEF aims to create a common Life Cycle Assessment based methodology to assess impacts related to a retailer's product portfolio. Overall, the OEF is considered a broader approach still under development, while the Swan is well-known in the Nordics. Their scopes, relevant impact categories and life cycle stages differed. However, climate change, resource use and biodiversity impacts were significant in both schemes. Possible synergies concern criteria setting, measurement and communication.



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