LUND UNIVERSITY

Influences, effects and changes from interventions by eco-labelling schemes - What a Swan can do?

Thidell, Åke

2009

Influences, effects and changes from interventions by eco-labelling schemes

What a Swan can do?

Åke THIDELL

Doctoral Dissertation
November 2009

The International Institute for Industrial Environmental Economics
Internationella miljöinstitutet

The cover painting is a reprint of a painting by the Lund artist Peter Jönsson. I told him about the content and he did this picture for me. Otherwise, it has not particular connection to the content. Rather, it's up to each and everyone to find his/her meanings. I really like it. It means a lot to me.

Thank you Peter!

Doctoral thesis in industrial environmental economics
at the International Institute for Industrial Environmental Economics
at Lund University
under the academic supervision of

Associate Professor Thomas Lindhqvist
and
Professor Donald Huisingh

Published in 2009 by IIIEE, Lund University, P.O. Box 196, S-221 00 LUND, Sweden,
Tel: +46 – 46 222 02 00, Fax: +46 – 46 222 02 10, e-mail: iiiee@iiiee.lu.se.
Printed by KFS AB, Lund.

ISSN 1402-3016
ISBN 978-91-88902-54-2

Acknowledgements

This journey has indeed been a long one. I know for sure that two persons, my great supervisors Thomas and Don, have had the most fundamental roles both for kick-starting the tour, serving as air navigation officers, as well as the best support I ever could think of when the landing was approaching. Thank you, guys! I don't really know how to express my gratitude.

The asset of the inspiring and creative teamwork spirit makes, in my mind, the IIIEE to a very particular workplace. Being part of this group of people, who believe that it's possible to make change, always supporting each other, showing the fighting spirit, whatever the task may be. That's a great experience and something to bear in mind. I would need a few more pages to name all of you who I've learned to know this way. Thank you all! You mean a lot to me!

A number of persons have contributed to my research on eco-labels. Mikael and Thomas enrolled me to the first Swan project back in 1993, and later on, in other projects. Elisabeth, Lena, Pia, Karin and Sara have left the research team, but your souls and contributions are still present. Lotta, you have shared many of the challenges and good moments our projects have brought us to. That's real fighting spirit. Teaming up with Bea, Helen, Burçu and Philip in different projects has rendered fruitful knowledge in areas neighbouring to eco-labelling. And we in the Team have all gained a lot of knowledge and inspiration from our Nordic research colleagues, in particular, Eva, Kristiina, Anna, Mari, Päivi and Erja at the National Consumer Research Centre in Finland and Birna and Stefán in Iceland.

Tareq, you have been my brother in arms when we have finalised our theses. Calle, you were of great help when pushing the last paper over the submission hurdle, and Adriana, thanks for chocolate, your kind thoughts and reminders about the next project. Kristina, you have fixed a number of practical arrangements for the process. Karin, Kristina, Åsa and Fredrik, you have guided me in the world of literature. Naoko, thanks for helping me with intervention theory, but also for showing the importance of legitimacy issues and there been taking a vital role for the bigger picture. Again, that's fighting spirit.

Håkan and Murat, you have covered up for me in many ways during this period, besides that you have frequently passed by for 'status checks'. Thank you for your patience. Peter, you have been supportive ever since our first stumbling steps on the road to research in cleaner production, as well as the streets of Berlin. Oksana, Lars, Chris, Andrius and Mårten, you have all

shared your wisdom with me and influenced the development of this thesis in one way or another.

A whole lot of people out there, in industries, trade, various organisations, public agencies, NGOs, eco-labelling schemes and more, have provided valuable empirical background material. You have set aside time for interviews, meetings, focus groups, shared your knowledge and experiences, shared documents and other information. Your contributions were crucial. Among all, I want to mention, Björn-Erik Lönn, the Nordic co-ordinator of the Swan scheme, who has been of great help over the years.

Finally, this dissertation wouldn't happen without the full support of my family. My parents, Ingrid and Sune, have always been there and taking care of practical things when help was urgently needed. My precious angels, Ebba and Freja, you have been cheered me up and kept reminding me what life is about throughout this process. Sanna and Agneta, you have served me food, happy smiles and lots of energy in the breaks. And some great moments under the stars.

I'm most grateful. Thank you all!

Åke Thidell

Lund, October 2009

Executive summary

Background and purpose

There has been an on-going debate on what possible effects eco-labelling cause ever since the schemes were introduced in the 1970s and 80s. The aim of this thesis was to examine the effects that have been empirically demonstrated or that are anticipated and suggested in the literature. The Nordic Swan, the common eco-label for the five Nordic countries (Denmark, Finland, Iceland, Norway and Sweden), is the focus for this thesis since the thesis author has participated in three major evaluations of this scheme, as well as, in a number of other studies that have scrutinised various aspects of the Swan.

The effects can be of different character. Some effects can then be directly related to the goals of the eco-labelling scheme. Such effects are related to consumers' demands for reliable eco-labelled products and for producers' ways to meet those demands through product re-design, improving their environmental performance, and thus, ultimately contributing to helping society make progress toward sustainable consumption and production. There are direct and indirect effects caused by secondary uses of information generated by the eco-labelling scheme, and some spin-off effects. Various direct effects have been examined in several research papers and evaluations of eco-labelling schemes. The indirect effects have, however, not been thoroughly examined; therefore they are given more attention in this thesis. The overarching research questions are:

- What are the direct and indirect effects/impacts of eco-labelling?
- How can these effects be detected and, if possible, measured?

The objective was to contribute to a more holistic understanding of the different effects eco-labelling schemes can have and to explore the ways different actors can benefit from these effects. An important feature when building such a picture is how the effects can be detected, measured, and quantified. The contribution to the knowledge of the characteristics of indirect effects is valid when the goal is to expand or to replicate them, and thus, to make eco-labelling schemes more effective by themselves or in conjunction with other efforts.

Framework

In most evaluations of eco-labelling schemes, frameworks for the analysis of intended effects or direct effectiveness have been applied. These direct effects have been assessed by applying proxy indicators, such as changed

consumer awareness and increased knowledge of the eco-label, market shares of eco-labelled products, market range of eco-labelled products, etc. The direct environmental benefits are rarely measured in quantitative terms. Despite the scarcity of indicators for such measurements, the train of causes and effects has been fairly well explored, in particular in comparison to the knowledge on how comparable relations influence actors and cause indirect effects. In contrast to direct effects, indirect effects were, thus far, only detected as qualitative evidence from stakeholder interviews. It was found that largely, frameworks for the analysis of indirect effects are still missing. In this thesis, concepts of intervention theory are applied in order to build an analytical framework for evaluating impacts of the labelling schemes.

The intervention theory is a model of the micro-steps or linkages in the casual path from a programme or intervention to ultimate outcomes. According to Vedung (1997), an intervention theory should outline the intended and unintended effects that are anticipated in the target area of the intervention, which in this thesis, are direct effects of the Nordic Swan scheme. In addition, anticipated and unanticipated side-effects should be included and examined. Such side-effects are the indirect effects that were evaluated and are reported upon in this thesis. The intervention theory applications used in this thesis are presented in Figure i.

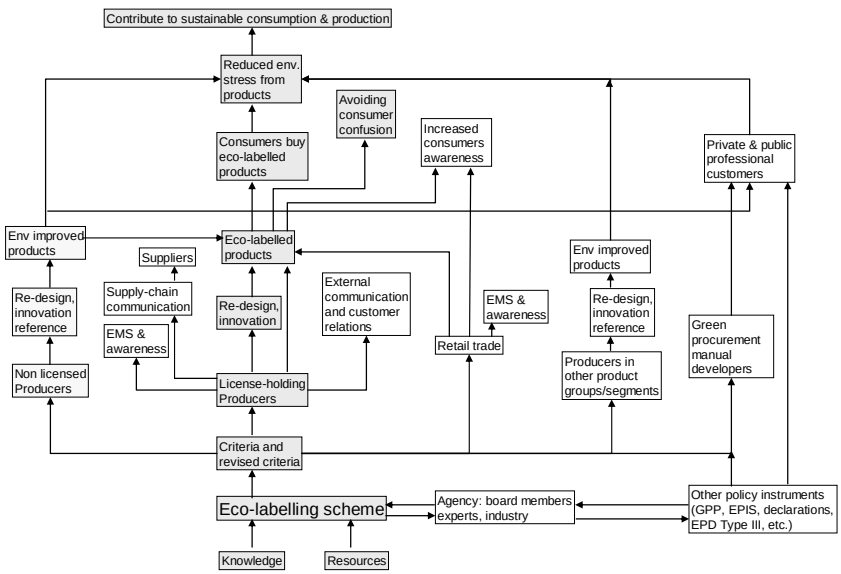

Figure i. Application of the intervention theory concepts within the Nordic Swan eco-labelling scheme. Shaded area represents direct effects.

Research methods used in this thesis

The background material for the thesis has been collected from literature, personal observations, documentary analyses, data gathered from secondary sources and, in particular, from quantitative interviews with representatives of the actors involved. All interviewed actor representatives were systematically selected in order to provide realistic and useful insights from the Nordic countries. In the different studies, the interviews were conducted by open-ended questions. This approach was found to be useful, due to the explorative approach that had to be applied since commonly used measurement methods and indicators were missing. The characterisations of indirect effects have mainly been clarified from qualitative evidence derived from the interviewees' perceptions, observations and practical experiences. Information from several sources have been compared and triangulated in order to draw more reliable conclusions.

Findings

The direct effects were examined by analysis of findings from several evaluations. These effects were analysed and published in Paper II. Actual environmental benefits from the Swan in terms of improved environmental performance of products and processes were demonstrated qualitatively but, thus far, they have not been quantified. There are no quantitative, easy-to-use, methods available since the direct environmental effects that were sought were found to be either too difficult or resource intensive to quantify. Instead, the environmental effects were deduced from a number of proxy indicators measured along the cause-effect chains of the intervention. Moreover, a common problem when analysing the identified effects is to establish the extent to which they can be attributed to the eco-labelling scheme as such and the extent to which they may have been caused by other influences. Until now, there is no obvious solution to this problem. Given that the environmental effects are more evident in some product groups than in others, it is clear that the Swan has had positive influence upon the producers of paper products, cleaning agents and detergents, printed matter/print shops as well as upon a number of service providers such as hotels and supermarket grocery stores. The efficiency of the Swan, expressed as cost-effectiveness, was found to be beneficial, when considering the modest annual state funding of the scheme. In a discussion on direct environmental effects of eco-labelling, it is also necessary to consider the inherent limitations of the policy instrument, including what product groups are suited for eco-labelling and what environmental aspects can be effectively addressed?

The indirect effects have been characterised and analysed and it is clear that the criteria documents were used as information sources in green procurement, they served as reference points in design processes, and provided inputs to and triggered the development of environmental management systems. Synergistic effects were found in the co-operation and co-ordination between the Swan and other eco-labelling schemes and environmental product information schemes. Because the criteria documents often served as common reference points, the environmental information was more effectively used, communicated and understood by the actors involved.

However, the indirect effects are dependent on the individual actors' willingness and ability to utilise information or react to influences from eco-labelling schemes for other purposes than just being awarded a licence for the eco-label. The attributability problem is also an uncertainty issue for the indirect effects.

Based on this thesis researcher's findings, he proposes that the efforts of the Swan scheme should be focussed upon: (a) new product groups primarily in the service sector, (b) finding and utilising the synergies with other environmental product information systems, and (c) development of improved quantitative and qualitative detection and measurement methods. Such future work could help researchers to more effectively determine the effects of the Nordic Swan eco-labelling scheme and to strengthen the Swan's capacity to have more proactive impacts upon the development and usage of new, more environmentally sound products and services.

Conclusions

This thesis author has concluded that intervention theory is a valuable conceptual framework for the examination of both direct and indirect effects of eco-labelling. It is a structured chain of outputs, immediate and intermediary outcomes and their potential to contribute to the goals of the intervention. Thus, it can be helpful for planning future research and for expanding the scope and impacts of the scheme and or to catalyse the integration of eco-labelling with other tools. The intervention theory will be expanded in the future, with new knowledge and when the effects are better understood. The process of expanding new dimensions of the intervention theory, in retrospect from previous evaluations of the Swan scheme, clearly showed how the picture of eco-labelling, as an intervention process has changed over the years, when previously unanticipated effects became significant empirical findings. The current scope of the theory can serve as a

platform for further exploration of the potentials of eco-labelling schemes and their combinations with other policy instruments.

Since eco-labelling schemes, like any other policy intervention, work in the context of a policy mix, a joint evaluation technique based on intervention theories should be developed and tested in order to better understand how suitable synergistic combinations of policy interventions can reinforce each other. Besides helping to reshape policy interventions, such examinations may contribute to a more holistic understanding of both the attributability of certain effects to different interventions, and the synergistic interventions that enhance the successfulness of eco-labelling schemes.

Finally, further research and development work is needed in the areas of methods and approaches for the quantification of direct and indirect environmental benefits. Demands for that kind of information are not explicit at present but they may be expressed in the future. The indirect effects appear to be or can be of significant importance and need further exploration. It is suggested that information pertaining to such examples should be collected and evaluated to develop a deeper understanding of the significance of indirect effects. A better understanding of the potential direct and indirect effects of the use of eco-labelling information can help all actors, including product designers, producers, wholesalers, retailers, consumers, NGOs and regulators to be more proactive. Hopefully, this will also help societies to reduce their ecological/carbon/toxics footprints and thereby, help them to make progress toward sustainability.

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List of Papers

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Paper I: Leire, C. & Thidell, Å. (2005b). Product-related environmental information to guide consumer purchases – a review and analysis of research on perceptions, understanding and use among Nordic consumers. *Journal of Cleaner Production, 13,* 1061-1070.

Paper II: Thidell, Å. (Forthcoming). Evaluation of European eco-labelling schemes: methods, measures and effects. Paper submitted to *Journal of Cleaner Production.*

Paper III: Nilsson, H., Tunçer, B. & Thidell, Å. (2002). The use of eco-labelling like initiatives on food products to promote quality assurance – is there enough credibility? *Journal of Cleaner Production, 12,* 515-524.

Paper IV: Backman M, Lindhqvist, T, & Thidell, Å. (1995b). The Nordic white swan: Issues concerning some key problems in environmental labelling. In E. Stø, *Sustainable consumption* (447-477), SIFO working report no 2-1995.

Paper V: Leire, C. & Thidell, Å. (Forthcoming). Green public procurement and the applicability of eco-labelling. Paper submitted to *Journal of Cleaner Production.*

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Abbreviations

BAT	Best Available Technique
BVD	Building material declaration (ByggVaruDeklaration)
EEB	European Environmental Bureau
EMAS	Eco-Management and Audit Scheme
EMS	Environmental Management System
EPA	Environmental Protection Agency
EPD	Environmental Product Declaration (ISO Type III)
EPIS	Environmental Product Information Scheme
EPR	Extended Producer Responsibility
EuP	Energy-using Products (EuP) Directive (2005/32/EC)
FSC	Forest Stewardship Council
GEC	Good Environmental Choice
GEN	Global Ecolabelling Network
GPP	Green Public Procurement
GRI	Global Reporting Initiative
GRIP	Green in Practice Foundation (GRønt I Praksis)
ICT	Information and Communication Technology
IFOAM	International Federation of Organic Agriculture Movements
IPP	Integrated Product Policy
ISO	International Organization for Standardization
KEPI	Key Environmental Performance Indicator
LCA	Life Cycle Assessment
MSC	Marine Stewardship Council
NCM/NMR	Nordic Council of Ministers (Nordiskt MinisterRåd)
NGO	Non-Governmental Organisation
NITO	Nordic IT Organisation
NMN	Nordic Ecolabelling Board (Nordiska MiljömärkningsNämnden)
PC	Personal computer
PCR	Product Category Rules
SCP	Sustainable Consumption and Production
SEMCo	Swedish Environmental Management Council
SSNC	Swedish Society for Nature Conservation
TCO	Swedish Confederation of Professional Employees (Tjänstemännens CentralOrganisation)
VAT	Value Added Tax
WWF	World Wide Fund for Nature

CHAPTER
ONE

1. Introduction

1.1 Background to eco-labelling

In the 1970s, industries with their smoky chimneys, heavily polluted aqueous discharges and mountains of solid waste became the foci of citizen concern. They were no longer willing to accept the environmental devastation caused by such irresponsible corporate activities. These problems were related to eutrofic lakes, mercury in fish, air pollution, depleted biodiversity, and so on. At that time the focus was primarily on local problems, but soon an increasing understanding emerged of regional and global problems, such as acidification, ozone and global warming (Miljödatanämnden 1982). Most legal actions and policy instruments were then developed to regulate industrial point sources. The industry was increasingly seen as both the polluter and the one that should reduce their emissions, which it did through waste separation and treatment approaches.

In the 1980s and 1990s, also the products and consumption became an important focus of citizen's environmental concerns for both ethical and environmental reasons. The conventional household offal, as a consequence of new products and consumption patterns, were identified as increasingly serious symptoms of the severe societal problems that were impacting ecological and human health of our societies. It became increasingly evident that the numerous diffuse sources of pollution were important and should also be addressed along with the industrial point sources. In the public debate, certain detergents were highlighted as being less polluting than others and, for instance, coffee produced in a way that was more ecologically sound and which was harvested and marketed in ways that provided fair economic returns to the producer, began to engage more citizens in the fight to make product, process and market improvements.

In parallel with the increasing product focus, the view (or paradigm) of the individual's contribution and responsibilities for both the problems and the solutions increased. Individuals increasingly became interested in becoming

environmentally conscious consumers who bought the less polluting detergents and coffee, the car owner that used her/his bicycle instead of his/her automobile and in becoming the more environmentally responsible and clever producer of more environmentally sound products. In his classic book, Johansson (1992) outlined both the context of environmental challenges and alternative solutions "the most direct method for changing the situation for the better lies in changing consumer habits (choice of products)….. Such a change requires no elaborated structural or legal changes; it does, however, require correct and continuous information." (p. 10).

The idea of non-waste technology that advocated systems approaches for the reduction or elimination of waste was introduced in 1974 (Purcell 1974). Later, the concept was reshaped in various concepts such as pollution prevention and cleaner production originating from the rationale of preventing environmental problems at their sources, rather than using sophisticated treatment devises for cleaning up after wastes have been produced. These integrated approaches may be a part of the same paradigm where individuals can make changes through their individual actions. These holistic, prevention-oriented perspectives are the foundations both for eco-labels and for this thesis.

The first eco-label, the Blue Angel, was introduced in Germany in 1978 in order to guide consumers, who wanted to promote the production and usage of environmentally sounder products, but who could easily be mislead by a multitude of more or less substantiated environmental claims that flourished in the market. The Blue Angel, eco-labelling scheme, was designed to provide consumers with easily accessible and reliable information about environmentally preferable products.

Subsequently, numerous interventions and policy instruments have been introduced to influence the environmental performance of products and product systems, such as bans of hazardous substances, taxes and tax-reductions, extended producer responsibility and additional information systems. As this process evolved, it became clear that product-related environmental policy instruments should have an element of flexibility so that they could foster and adapt to the development and usage of new knowledge, environmentally improved products and changing market situations. In comparison to the point sources at production sites, products are subject for much faster and less controlled change and development processes, they are influenced by far more disperse decision-making

processes among numerous producers and the by far larger numbers of consumers.

Subsequent to the development and implementation of the Blue Angel in Germany, many other eco-labelling schemes were introduced as informative and voluntary policy instruments in several countries, among them in the Nordic countries. These tools were based upon the premise that consumers should both be encouraged to and enabled to use their purchasing power to buy and use environmentally benign products. They can be encouraged to do that for altruistic (saving the environment) or more egoistic (personal health) reasons. Producers offering such products can use the eco-label for communicating their product's environmental features to the consumers. In that role, eco-labelling schemes serve as a consumer-oriented and an environmental policy instrument.

1.2 Description of the research problem

When eco-labels are introduced, just like any other policy instrument, it is important to evaluate and estimate if, and how much, they contribute to achieving the objectives and goals of the intervention. If they do so, what kinds of improvements in products and consumer behaviour do they catalyse? Additionally, it is important to seek to understand and document any negative consequences of the policy instrument. Moreover, some actors such as governments, which may provide funding and other resources, need to know if the resources are well used or if they could be better used in other ways. Hence, it is essential to evaluate the direct and indirect effects of the funds spent on eco-labelling schemes.

Some have criticised eco-labelling for causing doubtful benefits or for even causing negative effects. For instance, Erskine and Collins (1997) reviewed results derived from interviews and the literature, about perceived benefits and drawbacks of eco-labelling with a special focus upon the EU Eco-label. Among the drawbacks they found, a wide range were issues such, as eco-labelling being elitist, meaningless, unable to stop uncertified claims, unable to improve the environment, not being able to address many important environmental aspects, etc. Based on his report Morris (1997) stirred up the Green Goods conference in 1998 with massive criticism on all possible aspects of eco-labelling, including lock-in effects, coercive behaviour, low or no environmental benefits. In recent years, the negative critiques have been less significant, at least in the EU and the Nordic countries. But there

continue to be urgent needs to more effectively analyse the positive and negative effects of the eco-labels in relation to such challenges and critiques.

In recent years, eco-labelling has received increased interest and many actors have made claims about the eco-labels, and the knowledge eco-labelling schemes produce and how they can be used. Some product-labelling actors highlight secondary purposes, different from what the eco-labels were originally intended to achieve. It should be noted that many of these voices have claimed potential uses or indications of potential benefits, which require further exploration in order to verify or substantiate them.

The Integrated Product Policy (IPP) and later the policy area of Sustainable Consumption and Production (SCP) have the objective of co-ordinating and when possible finding synergies between/among product policies and product-related environmental policies to overcome the sometimes conflicting policy measures. Since eco-labelling schemes operate in an environment of several policies, all of them must be regarded in parallel with the business and market realities of the producers, consumers and the eco-sphere.

Thus, it is relevant to sort out the arguments and to document the effects from eco-labelling that can be detected and, if possible, measured with appropriate methods. Since the schemes are in place, it is important to develop and use tools or approaches to reinforce and better utilise the positive effects from eco-labelling. From such studies, more can be learned about eco-labelling as a policy instrument and its synergistic effects when combined with other activities, tools and instruments.

1.3 Scope and limitations

The scope and limitations of this thesis are that the focus is on the traditional positive and voluntary eco-labels for products and services, built on life cycle considerations and multi-aspect criteria. The schemes are operated by third party organisations that are independent of the interests of the producers, consumers and other influencing parties. This kind of eco-label is commonly referred to as Type I labelling in the international standardisation vocabulary. The principles and definition of Type I eco-labelling are further outlined in Section 2.2 of this thesis, as well as other labels, and environmental product information schemes. In the literature, the word 'environmental labelling', is sometimes used interchangeably with

eco-labelling; although there can be different interpretations. In this thesis, the word 'eco-label' only refers to Type I.

In some situations, in particular when discussing indirect and synergistic effects, there is a need to extend the scope of discussion into neighbouring areas, such as product groups beyond the scope of eco-labelling, environmental declarations, green procurement and green procurement manuals, other labels, etc. The contexts are explained in the appropriate sections of this thesis.

The direct and indirect effects that are of interest for this thesis are the effects on actors, the roles of other policy instruments, and the environmental objectives, purposes, functions and knowledge of eco-labelling as they are designed to contribute to achieving the sustainable consumption and production goals of the scheme. More peripheral effects on, for instance, world trade and protectionism, which are sometimes mentioned in the debate, are outside the scope of this thesis.

The thesis is further limited to effects of the Nordic Swan eco-labelling scheme and its operations in the Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden). The Nordic Swan is the official eco-label in the Nordic countries and was initiated in 1989. Data and pieces of information and references from the literature and international studies are used and considered as supplementary and comparative information, as applicable.

The justification of a Nordic scope is both rational and relevant. The rational reasons are that the Nordic scheme constitutes a well-defined entity in a well-defined geographic region to be researched in some detail and thus, it provides better opportunities to avoid scattered or anecdotal information. Moreover, the Nordic scope is justified by the common notion that the Nordic region constitutes a well-functioning region in terms of a common market that has been exposed to eco-labelling for two decades. It is sometimes claimed that the Nordic countries are the most eco-labelled countries in the world. The Nordic countries have worked closely together with similar environmental priorities for many years. Hence, experiences from the Nordic scheme can be valuable in respect to its relations to the EU Eco-label and other international initiatives within labelling and specific product-related environmental information. In addition, the relevance is related to this thesis author's personal involvement in a number of projects

that have addressed the Nordic Swan and other kinds of environmental product information systems.

The EU Eco-label is valid in all Nordic countries and is gradually gaining recognition and an increasing number of EU Eco-labelled products are available on the market. In Sweden, the Swedish Society for Nature Conservation (SSNC) is operating a private NGO-controlled eco-label, the 'Good Environmental Choice' (GEC). The EU Eco-label and GEC are considered whenever relevant, in this thesis. The minimal referencing to the EU Eco-label and GEC is not meant to overlook them. They are eco-labels that deserve their own comprehensive examinations.

1.4 Aims, objectives and purposes

The thesis builds on the evolution and implementation of the Nordic Swan with the aim of contributing to a better understanding of what actually happened when that policy instrument was introduced in 1989 and has been in place 20 years. Eco-labelling has its own aims, purposes, objectives and goals; several results and effects have been reported in relation to them. In addition, the more or less expected secondary influences and effects have been detected, assumed or simply suggested. The prime objective of this thesis is to explore the area of operation of eco-labelling, that is, what it can accomplish and what the limitations are; thereby this thesis author seeks to place the Nordic Swan eco-label scheme in the larger context of tools designed to promote sustainable consumption and production. Thus, the thesis deals with effects related to matters causing beneficial environmental effects. Potential success of eco-labelling is reflected in this thesis but it does not examine constituents or design of a successful eco-labelling scheme.

Detection and measurements of effects is, of course, a matter of methods and measurement points chosen. Therefore, it is important to better understand the qualitative nature and the quantitative magnitude of an effect a certain method can or cannot provide. The analysis of methods and results can identify needs and bring about further methodological developments.

Both the Nordic Swan scheme, as such, and the environment within which it operates are dynamic and constantly changing. This thesis is designed to highlight some of the developments that have occurred since the Swan was introduced as a policy instrument in 1989. This thesis author suggests

potentially useful future developments of both the Nordic Swan and other schemes.

1.5 Research questions

The overarching research questions of this thesis are:

- What are the direct and indirect effects/impacts of eco-labelling?
- How can these effects be detected and, if possible, measured?

The results of the analyses are used for a discussion on the wider aims of this research. The discussion addresses the current and potential future roles of eco-labelling, its limitations, and its place in new and potentially fruitful combinations of policy instruments and information systems. Thus, the outcomes of this research can contribute to make eco-labelling schemes more effective.

1.6 Intended target groups

This thesis author's intention is that the following actors will find the results of this thesis useful:

- Producers who want to deepen their knowledge about the interplay between/among different instruments and tools promoting cleaner products, cleaner production and preventative environmental strategies, especially in the context of the role of eco-labelling. They can also consider the results of this thesis when preparing to fulfil environmental demands and meet expectations in the marketplace.
- Policy-makers making decisions on product policies can gain understanding about the functions, potentials and restrictions of eco-labels and how they work together with other kinds of policy instruments, as well as, the value of supporting different combinations of such instruments.
- Eco-labelling practitioners and people involved in other environmental product information schemes can gain understanding of how these various schemes coincide with each other or better could do so. How effects of eco-labelling schemes are evaluated implicitly tells what is commonly seen as an eco-labelling scheme's success factors of effectiveness and should

therefore, be regarded or defined by the scheme management or by the policy-makers.

- Academics and others doing research and development in the area of environmental product information can benefit from the knowledge on effects, methods and symbiotic relations between eco-labels and other policy instruments.
- Consumer and environmental NGOs, as well as, the interested public, can gain knowledge and, hopefully, inspiration on how to use the eco-labels and related instruments in new and better ways. The concerned consumers may also be interested in how current eco-labels influence and can help them to change their behaviours to more ecologically sound choices.

1.7 Research methods and data collection

Eco-labelling as a set of phenomena, bridges a number of traditional disciplines. Insights in business administration and marketing are essential to understand the market conditions and dynamics for the label to be influential, to identify suitable product groups for labelling, etc. Environmental and natural sciences are part of the equation in order to understand the environmental situation and the aspects that the labels should address. Finally, insights into industrial realities and engineering are key to understanding the differences between conventional and superior products and the reasons for these differences. Most changes needed in order to improve products, product chains and systems, lay in the hands of those who design and produce the goods and services. These are people in numerous companies and organisations who have to balance their time and resources between environmental concerns and all other aspects that make them competitive on the market. The latter indicates that efforts invested in the eco-labelling scheme are of little value, if no consumers are willing to purchase eco-labelled products. The attributes of the eco-label, work in relation to all other aspects that make the products attractive. The different competences are spread among many experts, actors and interested parties, often with different opinions or interpretations of facts and information, as well as different economic interests and views of problems and solutions. Thus, eco-labelling is an interesting consensus-making process in a sophisticated interplay among business realities, natural and social science and political arguments.

The beliefs and mindsets of researchers that are referred to as their paradigm or discourse, help them to interpret the world and to enable them to build a knowledge base upon which they build as they proceed with their work. This thesis author's ontological position is that the world around us exists regardless of the author's mindset about it, but can probably not be described in one clear-cut way. Instead, or at least for the time being, there are many parallel explanations and perceptions of the real world. These vary between individuals and over time. Reality can be researched from our assumptions of its nature and can be understood as 'estimations' of the limitations of our language(s) to describe and communicate about our insights. These descriptions are valid until another description complements or better fits the phenomena that are the subjects of our attention. This view contrasts with the belief in a 'universal' or 'real' universe or knowledge that, according to some paradigms, exists regardless of the presence of a researcher or of any other human being.

The thesis is built upon empirical material collected since 1993 when this thesis author first examined and evaluated the Nordic Swan, its applications and effects, development of its internal organisation and financial foundations. Thus, the background material is comprised of the academic articles, scientific reports and studies listed below. The long-term engagement of this thesis author in research on the Swan provided him opportunities to follow its development and to discuss changes and issues in a contextual setting. It should be underscored, however that this thesis author's engagement was not within the nature of action research. The studies have always been conducted from an outside perspective vis-à-vis the eco-labelling scheme.

In each of the appended papers, the applied methods are described individually. Mostly, they follow (a combination of) the general methods that are justified and outlined below. Multiple methods allow for triangulation of findings.

A consistent driver for this thesis author was to understand how eco-labelling works, in practice, how it can be improved, and therefore, deliver information that can be more useful in the promotion of production and usage of cleaner products and services. In order to make progress in this direction, this thesis author advocates the use of empirical methods designed to go as close as possible to the actors involved. Hence, the main method for information generation has, in most studies, been structured and semi-structured interviews with the actors including eco-labelling practitioners

(i.e. staff and board members of the national competent bodies), stakeholders and stakeholder representatives, producers as well as industry representatives.

The method has the drawback of being influenced by the researcher's normative aspects. This thesis author has addressed this issue through open-ended questions, which invited the respondents to elaborate answers with a minimum of influences by the interviewer. The merits of this method, explanations, opportunities for clarifications, follow-up questions, etc. outweigh the drawbacks.

In all studies, the information sources and interviewees have been selected in a systematic way in order to provide holistic views and to collect information in a structured manner. In the interviews, the objectives were developed to help the author to build case-study-like examples, gather and evaluate personal experiences and opinions and to develop descriptions of applications or reasons for limited applicability. The objective was not to collect data for statistical analysis, but rather to identify and characterise trends, predominant uses and applications of the Swan and other relevant insights pertaining to the scheme. Thus, the examples are well grounded and derived from relevant sources and should be seen as qualitative evidence. In some instances, the term 'anecdotal evidence' is used, which is related to the use of a specific evaluation framework developed by the U.S. Environmental Protection Agency (US EPA 1994). It uses the word primarily in the meaning of grounded qualitative evidence (and not with the negative connotations it may contain, in some instances).

The collection of qualitative information has been supplemented with secondary information provided by interviewees, desktop analysis of relevant literature and document reviews, in addition to conventional chasing for data and pieces of information.

1.8 Disposition of this thesis

Since this thesis addresses effects from eco-labelling, the concept of eco-labelling is introduced in Chapter 2 and the Nordic Swan scheme is placed in the context of other environmental product information schemes, environmental management, and other regulatory policies. The chapter presents intervention theory as the research framework. In Chapter 3 the direct effects of eco-labelling are outlined. These effects are often analysed

in traditional evaluations, but are here reflected upon in relation to the meta-analysis of several European evaluations, which are reported upon in Paper II. The indirect effects are discussed and analysed in Chapter 4 from the foundations established based upon intervention theory. The results of the analyses are used to support the author's discussion on empirically documented and anticipated indirect effects and upon the opportunities to detect and describe them more effectively. The chapter builds on several studies of the Swan scheme, conducted by the thesis author when he was teamed with colleagues, over the years. Chapter 5 is devoted to analysis and discussion of the findings from the previous chapters. It sums up and extends, the outcomes to further implications reflected in the selected evaluation criteria, the research methods and the measurability of the effects. Finally, the main conclusions and recommendations for future research and development derived from the results of the analyses are elaborated in Chapter 6.

Five papers, published or submitted to peer-reviewed journals and one book chapter, document inputs for this thesis; they are appended to this thesis.

1.9 List of Appended Publications

The papers appended to this thesis are listed below. They are the result of a number of studies conducted with various researchers-colleagues at the IIIEE. The authors' names are, according to the original tradition and custom of the institute, given in alphabetic order on the publications.

Paper I: Leire, C. & Thidell, Å. (2005b). Product-related environmental information to guide consumer purchases – a review and analysis of research on perceptions, understanding and use among Nordic consumers. *Journal of Cleaner Production, 13,* 1061-1070.

Paper II: Thidell, Å. (Forthcoming). Evaluation of European eco-labelling schemes: methods, measures and effects. Paper submitted to *Journal of Cleaner Production.*

Paper III: Nilsson, H., Tunçer, B. & Thidell, Å. (2004). The use of eco-labelling like initiatives on food products to promote quality assurance – is there enough credibility? *Journal of Cleaner Production, 12,* 515-524.

Paper IV: Backman, M, Lindhqvist, T, & Thidell, Å. (1995b). The Nordic white swan: Issues concerning some key problems in environmental labelling. In E. Stø, *Sustainable consumption* (447-477), SIFO working report no 2-1995.

Paper V: Leire, C. & Thidell, Å. (Forthcoming). Green public procurement and the applicability of eco-labelling. Paper submitted to *Journal of Cleaner Production.*

1.10 Other relevant publications of the author

Below is a list of publications that are the result of studies conducted by the thesis author and researchers-colleagues in Sweden, Finland and Iceland. These publications provide more details on the studies that are drawn upon for the thesis. The authors' names for these publications are generally given in alphabetic order as agreed within the research teams and in line with the original tradition and custom of the IIIEE. In case of Leire et al. (2004), the order reflects the design of the research project, while Heiskanen et al. (1998) has the Finnish researchers in alphabetic order first, followed by the Swedish team, also in alphabetic order. These reports will be referred to with all authors throughout the thesis to highlight to the reader when materials from studies involving the thesis author are drawn on. For practical reasons, the report by Heiskanen et al. (1998) will, but for the first time in every chapter, be referenced in this abbreviated way to avoid having to repeat the names of all seven researchers repeatedly.

Aalto, K., Heiskanen, E., Leire, C. & Thidell, Å. (2008). *The Nordic Swan – From past experiences to future possibilities. The third evaluation of the Nordic eco-labelling scheme.* TemaNord 2008:529. Copenhagen: Nordic Council of Ministers.

Leire, C. & Thidell, Å. (2005a). Indirect effects of eco-labelling – the case of purchasing tools: In *Conference procedure paper for LCM 2005 – Innovation by life-cycle management*, Volume 2, Barcelona, September 5-7, 2005.

Leire, C., Thidell, Å., Helgadottir, B., Gislason, S., Pylvänäinen, E. & Niva, M. (2004). *Consumer perceptions, understanding and use of product related environmental information - A literature review of the Nordic knowledge base.* TemaNord 2004:539. Copenhagen: Nordic Council of Ministers.

Edlund, S., Leire, C. & Thidell, Å. (2002). *Svanens roll i förhållande till andra miljöinformationssystem och miljöledning [The role of the Swan in relation to other*

environmental information systems and environmental management]. TemaNord 2002:517. Copenhagen: Nordic Council of Ministers.

Heidenmark, P., Jönsson, K., Lindhqvist, T. & Thidell, Å. (2001). *Evaluation of the environmental effects of the Swan eco-label – final analysis*. TemaNord 2001:516. Copenhagen: Nordic Council of Ministers.

Heiskanen, E., Kärnä, A., Niva, M., Timonen, P., Munch af Rosenschöld, E., Pripp, L. & Thidell, Å. (1998). *Environmental improvement in product chains*. TemaNord 1998:546. Copenhagen: Nordic Council of Ministers.

Backman, M., Lindhqvist, T. & Thidell, Å. (1995a). *Nordisk miljömärkning [Nordic eco-labelling]*. TemaNord 1995:594. Copenhagen: Nordic Council of Ministers.

Kogg, B. & Thidell, Å. (2003). *Utvärdering av system för egendeklarationer av farliga kemiska ämnen i varor – Exempel från byggsektorn och textilindustrin [Evaluation of self-declaration systems of hazardous chemical substances in articles – Examples of building materials and textile industries]*. Report 2/03. Stockholm: The Swedish Chemicals Agency.

CHAPTER
TWO

2. Research framework and contribution to theory

2.1 Rationale for eco-labels

The presence of environmental claims on products indicates that producers perceive that consumers view them as favourable in comparison with other products on the market, positive for the brand image or bring positive connotations in a more general way. There is a notion that consumers, or at least a significant segment of consumers, consider environmental performance of their purchases as one criterion for their purchases. A multitude of different claims, logos, symbols, statements or declarations may be confusing or even misleading for the consumers, which is one reason for public bodies and other organisations to regulate and standardise the messages. The launch of eco-labelling schemes is one approach designed to help to clean up the wide array of unclear, conflicting and confusing environmental marketing.

Another reason for policy-makers to introduce positive and voluntary eco-labelling schemes is to use market mechanisms in order to enhance the demand for environmentally sounder products and to make it interesting and more feasible for producers to specifically consider environmental features when designing, producing and marketing their goods and services. Thus, use of eco-labelled goods and services should help to contribute to reduced environmental stress and more sustainable consumption and production patterns. The theory behind eco-labelling is based upon the assumption that products, within a defined product group, show different environmental performances. The role of an eco-labelling scheme is to distinguish the environmentally superior products from the bulk within the product group and to provide producers with a reliable communication tool and a competitive market advantage (Salzman 1991b, p. 12).

The goals and objectives of eco-labelling, as discussed in subsequent paragraphs, is a compilation from several sources: Hirsbak, Nielsen and Lindhqvist (1990, pp. ii-iii), Salzman (1991b), Salzman (1991a, pp. 12-13), US EPA (1993, p. 9), US EPA (1994, pp. 13-14) and OECD (1994, p. 35). The more precise phrasings are presented in Annex 1. These sources were selected because they heavily influenced early phases of the development of eco-labels.

Besides offering consumers accurate information, the core function of an eco-label is to increase the demand for environmentally preferable products. Producers that either offer environmentally benign products in the first place or change and improve the environmental performance of their products can choose to use the eco-label as a means to communicate their new or improved attributes to the market. Consumers and customers considering such improved functionality can use the eco-label as guidance for their purchases.

The purpose is to shift the demand from conventional to more environmentally benign products. The induced market pull influences other producers to also improve their products and thus, can cause market dynamics favouring a transition towards environmentally preferable products.

The goal or objective is to continuously improve the environmental performance of products and the production of them and thus decrease negative pressure on the environment. Regular revisions raising the requirements for awarding the eco-label cause a dynamic, continual improvement process.

The central organisation of an eco-labelling scheme is the decision-making 'competent body', board or jury. This board has, through its decisions, the prime task to maintain and reinforce the credibility and trustworthiness of the scheme, which is the most prominent asset for a system and the guarantee for the values for which the label stands. This aspect is further elaborated upon within Paper III. The decision-making process revolves around selecting and defining product groups for eco-labelling and deciding upon the requirements an eco-labelled product must fulfil.

This competent body is also responsible for issuing licences to producers that wish to eco-label their products after verification of compliance to the requirements for their type of product. The eco-labelling organisation has

the right and responsibility to perform compliance evaluations of the company's fulfilment of the product group requirements. The organisation functions as the independent 'third party' and can consist of individuals with expertise from or representing different stakeholders or simply of trustworthy experts from different fields of knowledge. One duty of this organisation is to balance the different interests. Hence, transparency and open stakeholder consultations are essential for decision-making and credibility.

The stakeholders or interested parties are actors from consumers and environmental NGOs, producers and their associations, governmental agencies and authorities, and various experts. It should be underscored that the people from agencies and authorities are primarily representing the knowledge of these organisations and not the political influences. They can also connect activities in the eco-labelling body with similar activities in other policy areas.

2.2 Taxonomy for voluntary information schemes

This thesis deals with voluntary and positive Type I eco-labelling, but there are several other environmental information schemes in the public domain working in similar or related areas. In this section, the most prominent kinds of environmental information systems are briefly introduced in order to place eco-labels in context with other types of environmental information individuals may obtain and use in helping them to make product or service purchase decisions.

The International Organization for Standardization (ISO) and other bodies have, until now, only standardised a few of the information sources. This sorting may be viewed as an exercise of academic value only, since consumers and others using the information and environmental logos primarily do it by trust and not by particular details, which is elaborated on within Paper I. The definitions have, however, wider implications. In this thesis, it is justified for the context and since the concepts are further used in the text. Moreover, some of the similarities and differences between/among the schemes are necessary to bear in mind when discussing various effects of eco-labelling. A sorting scheme indicating their relations is provided in Figure 2-1. It is clear that only voluntary market-based, environmental product information schemes are included, with provided examples mostly selected from the Nordic market.

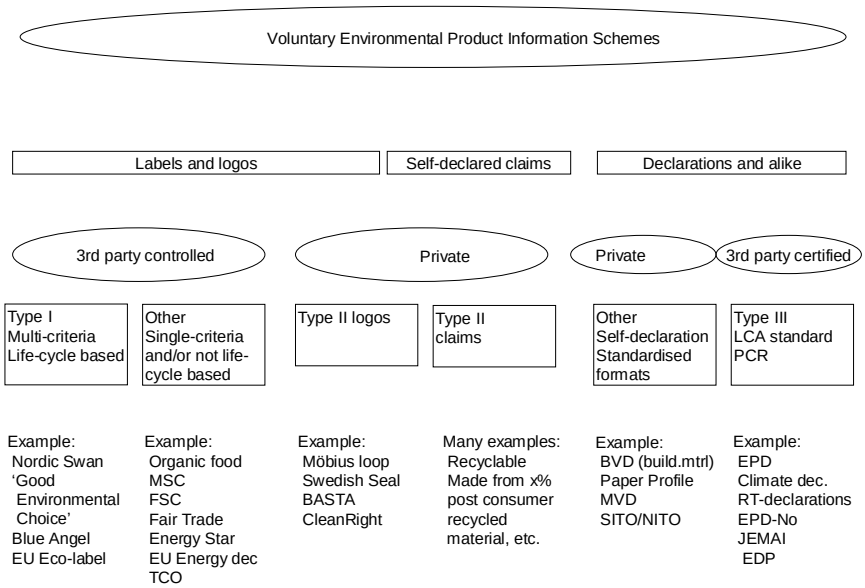

Figure 2-1. Common voluntary Environmental Product Information Schemes (EPIS) in relation to the typology standardised by ISO.
Note that besides those accounted for in the figure, a number of unsubstantiated and potentially misleading logos and claims are on the market.

2.2.1 The ISO 14020-series

ISO launched the first standards on 'Environmental labels and declarations' in the ISO 14020 series in 1998. ISO made standards for three kinds of environmental messages: 'traditional' eco-labelling that in the standard are called environmental labelling Type I (ISO 14024), self-declared environmental claims Type II (ISO 14021), and environmental product declarations Type III (ISO 14025). The concept called 'environmental label (Type I)' in the ISO terminology is equal to the term 'eco-label', used in this thesis. These standards define the terms used, the objectives, principles and procedures of the schemes.

2.2.2 Third-party certified eco-labels Type I

Beside the previously highlighted general characteristics of an eco-labelling scheme, there are some key features, which are specifically valid for Type I eco-labelling. ISO defines a Type I programme (or scheme) as:

> *Voluntary, multi-criteria-based third party programme that awards a license which authorizes the user of environmental labels on products indicating overall environmental preferability of a product within a particular product category based on life cycle considerations.* (ISO 14024:1999)

In this definition, the principle of 'life cycle consideration' is a differentiator from many other kinds of labels. It establishes that:

> *The objective of reducing environmental impacts …. is best served by considering the whole life cycle when setting product environmental criteria. Life cycle stages to be taken into account when developing the product environmental criteria should include: extraction of resources, manufacturing, distribution, use and disposal relating to relevant cross-media environmental indicators.* (ISO 14024:1999)

The requirement for including the whole life cycle, and to address the most relevant aspects within the performance requirements in the criteria document, makes Type I eco-labelling unique. There are other schemes and systems that regard the life cycle but without establishing environmental performance requirements. They have, on the other hand, other characteristics.

Besides the previously mentioned Blue Angel, the Nordic Swan, Good Environmental Choice (GEC), and EU Eco-labelling schemes, there are other Type I product-labelling schemes in many countries. The Global Ecolabelling network (GEN), the international network of Type I schemes, has more than 20 member schemes, but there are many more schemes on the global arena. For example, recently, a new eco-label on the African continent was introduced in Tunisia as a European aid project.

2.2.3 The TCO label

The TCO label was introduced by the Swedish Confederation of Professional Employees, a trade union, in 1992 as a third party labelling scheme. It has expanded the original scope of aspects related to the work environment and ergonomics for monitors and displays to include several

aspects, also environmental, for a broader range of ICT products and office furniture (TCO Development n. a.).

The TCO label has reached a significant dissemination worldwide and has the purpose of driving the technical product development towards the top end, just like Type I eco-labelling. However, the product group criteria are not built upon on life cycle considerations like eco-labels, but include several environmental aspects, as well as, social and product quality requirements. The TCO scheme is a member of GEN, but it is not included in this thesis among the Type I eco-labels due to the fact that it does not include life cycle considerations in the criteria development.

2.2.4 Organic production and raw material labelling

The organic labelling schemes address production methods without pesticides and artificial fertilisers. Organic agriculture is often perceived as environmentally preferable and produces more healthy products, but it also includes animal welfare and other ethical as well as social values. Most organic products are related to foodstuff but there are in addition organic flowers, and textile fibres. Paper III showed that in the EU alone, there were more than one hundred different food labels, which are mostly focused upon organic foods production, local production or a combination of them.

There are norms that serve as criteria for organic production and processing issued by the International Federation of Organic Agriculture Movements (IFOAM) (IFOAM n.a.). The EU regulation on organic production and labelling of organic products (Council Regulation 834/2007) serves the function of a standard within the EU. IFOAM is operating as an independent third party organisation, while the third party role of the EU can be debated.

The organic food labels differ from Type I labels since they only regard certain features of the production. Here the life cycle consideration criterion is not regarded in the same way as Type I labels. There is, in addition, a debate about the scientific evidence of the environmental preferability of organic production and normative stances in the promotion of such products. This is an interesting discussion, but is not the subject of this thesis.

Besides labels for organic production, there are additional third-party or third-party-like labels, that primarily deal with the upstream extraction or

production of raw materials. Among many others, WWF facilitates labels addressing bio-diversity through sustainable forestry in the Forest Stewardship Council (FSC) and through sustainable catchments of fish and aquaculture in the Marine Stewardship Council (MSC). Both of these labelling schemes conduct criteria development in stakeholder consultation processes, but lack the full life cycle considerations. The FSC label on the product informs the consumer that the wood in a piece of furniture or the wood fibre in a piece of paper has been produced in forests that have been managed according to sustainable practices.

2.2.5 Labels and declarations for energy and climate

Energy labels, such as the Energy Star and the EU Energy declaration, mainly consider the products' energy consumption in the use phase. The US initiated Energy Star scheme was first designed to establish a voluntary minimum standard for energy performance of PCs and monitors purchased by the authorities. The system has been expanded both geographically and into new product areas; however the focus on improvements in energy performance has been continued. The Energy declaration is mandatory in the EU for certain energy-using products. The declaration provides graded information on energy efficiency in relation to other similar products and leaves the evaluation for the purchase decisions to the consumer.

Climate labelling is still in its infancy, but several labelling schemes are emerging, particularly for foodstuffs. Paulavets (2008) examined recent initiatives and reported several projects on 'food miles', informing consumers on how far and by what means food products have been transported, but no other climate-related attributes were regarded. Another direction of development she found is different combinations of existing food and new climate labels, mainly exposing the product's 'carbon footprints' (Paulavets 2008).

There is an on-going process with the aim of exploring possibilities for including consistent carbon footprint, climate information to be attached to the EU Eco-label criteria (DG Environment n.a.).

More recently, the carbon footprint concept has been a subject of standardisation. A British standard (BSI PAS 2050:2008), currently under development, takes a life cycle perspective on this focal area. Along this road, there is a newly established single-issue climate version of the LCA-based environmental product declaration (Type III) declarations. The

climate declaration accounts for a product's total climate impact from all kinds of greenhouse gas emissions through a systematic calculation method that includes all phases of the life cycle (Environmental Management Council n.a.). The Type III environmental product declarations are briefly explained in Section 2.2.7.

In conclusion, no single energy and climate labelling initiative incorporates the multi-criteria and life cycle approach of Type I eco-labelling, but some include some of the life cycle considerations. New approaches to combinations of climate labelling and eco-labelling or systematic inclusion of climate-related aspects into Type I labelling schemes are being developed.

2.2.6 Self-declared claims and private labels

The environmental claims are short messages, symbols or graphics, which indicate something about an environmental aspect of a product, a component or a package. Such claims often lack transparency, therefore, it can be difficult to access if they are reliable. In some cases, the claims are misleading or difficult to associate with the product, but there are also examples of accurate and relevant statements and claims. Moreover, some producers affix their own logos with more or less clear environmental connotations. These logos can be falsely interpreted as eco-labels. Again, some of them have a clear meaning for those who make the effort to search for background information, although many are more ambiguous in the information they provide. Unsubstantiated messages are considered to be a serious problem; these problems are being addressed by some consumer agencies.

ISO prepared a standard (ISO 14021) for self-declared claims in 1999 with the explicit objectives of reducing market confusion and providing the benefits of accurate and verifiable environmental claims that are not misleading. In contrast to eco-labels (Type I), self-declared claims are made without any certification by an independent third party. But the producers must, upon request, be able to explain and substantiate their claims (ISO 14021:1999).

2.2.7 Other kinds of environmental information

There are, besides the previously highlighted labels, other kinds of information carriers, schemes and systems designed to help manage or

convey information to consumers, professional purchasers and/or to other actors in the product chains. An incomplete list of them is presented in Table 2-1. Some of them relate to each other, or could complement or replace each other depending upon the user's needs.

One apparent substitute to Type I eco-labels may be the declarations that are designed to convey more extensive and often quantitative information. Many of them, and, in particular, the environmental product declarations (Type III) are based on life cycle assessments (LCA). In the case of Type III declarations, it is a requirement that the LCA is conducted according to the ISO standard 14040. In the environmental product declaration (EPD) system, the information should be presented according to a pre-set format, the so-called product category rules (PCR) (Environmental Management Council. n.a.). Other declarations can follow certain formats agreed among the users or proposed by the initiators. In the Nordic market, these kinds of declarations are the most common since some thousand building products are declared in formats related to the Swedish Building Material Declaration (BVD in Swedish) scheme (Kogg and Thidell 2003, p. 12). Moreover, some industry associations have initiated declaration schemes for wood products (Trätek), textiles (Swedish Textile and Clothing Industries Association), and ICT equipment (NITO).

In the Nordic countries, guidelines and manuals have been developed for professional purchasers, both in private and public organisations. These guidelines and manuals have a function parallel to eco-labelling by identifying products with better environmental performance. However, when eco-labelling displays environmentally benign products supplied by the producers, the green procurement manuals aid the purchasing officers to screen for such products, labelled or non-labelled, by evaluating information requested from the producers. The findings presented in Paper V reveal that the environmental requirements stipulated in these manuals were influenced by, but not identical to, the environmental criteria used by the eco-labelling schemes.

Environmental management systems (EMS) are not intended as external communication tools, but have sometimes been used as a substitute to eco-labelling and other environmental product information schemes (EPIS) (Edlund, Leire and Thidell 2002, p. 60).

Social labelling does not consider environmental aspects as such, but could implicitly include them as requirements for occupational health and safety

aspects in the production phase. The social and ethical aspects are also discussed in a wider, sustainable development perspective.

Table 2-1. Selected environmental information carriers

EPIS/tool	Nature	Information
Social labelling	Certified by independent 3rd party but regard social and ethical issues in the production.	Yes/no information to consumers
Environmental product declarations (Type III)	Non-judgemental life cycle information provided according to pre-set structure. LCA background certified by an accredited body.	Extensive information including quantified data
Self-declarations	Not certified, non-judgemental information in free format or according to pre-set form. May be based on life cycle considerations.	Extensive information including quantified data
Professional purchase manuals	Guides for professional procurement including suitable requirements and means for verification.	Information on suitable requirements
Product specification sheets	Features and data on specific product. May include environmentally-related information in a free format.	Environmental information may not occur
Material Data and Safety Declarations	Self-declared information on, among others, hazardous properties of contained substances according to pre-set forms and requirements. For chemical products.	Extensive information including hazardous properties
GRI/social reporting	Corporate social commitments and management.	No product-specific information
EMS	Structured system for managing environmental matters in a company.	Company can inform about presence of EMS
EMS/voluntary environmental report	Voluntary report of achievements of the EMS.	Information on environmental matters to stakeholders
Mandatory environmental report	Report to controlling authority regarding compliance with set environmental permit.	Not addressing products in most cases

Derived from Edlund, Leire and Thidell (2002, Section 2.2) and Aalto, Heiskanen, Leire and Thidell (2008, Ch. 7).

2.3 The Nordic Swan eco-labelling scheme

The Nordic Swan scheme was introduced as the official eco-label by a decision of the Nordic Council of Ministers (NCM) in 1989. Norway and Sweden were the original members while Finland joined in 1990, and Iceland in 1991. By then, Denmark had observer status, but became a full member of the scheme in 1998. The Nordic Swan was launched by the endorsement of the governments and is partly funded by the Nordic governments. However, the responsibility and the daily operations are placed in independent organisations. The scheme consists of national competent bodies with representatives from trade, industry, environmental and consumer agencies and NGOs. The scheme has a common Nordic board that takes decisions on product groups and criteria. The criteria are developed in expert working groups, supported by external experts and actors. Before the final product group criteria decisions are made, draft product criteria are revised after being open for public comments.

Currently, there are established criteria for about 65 product groups[1] but some of them cover several sub-product groups. The product groups can be divided into three larger product areas: (a) groceries and products for everyday life; (b) products related to buildings, vehicles and energy; and (c) products for professional users. The borders of these product areas are, however, not clear-cut.

There are more than 5,000 Swan-labelled products distributed over about 1,800 licences awarded to almost 1,000 licence holders on the Nordic market (Lönn, B.-E., personal communication, 16 September 2009). The numbers of product groups covered by the Swan have steadily increased in the last few years. The number of Swan-labelled products is difficult to calculate exactly because the same licence could include several product names and variants.

In 2006 the Nordic scheme (national bodies and Nordic co-ordination) had a turnover of about 7.6 million Euro. The funding from licence fees was 5.5 million Euro and the Nordic governments and the NCM contributed an additional 2.1 million Euro (Aalto, Heiskanen, Leire and Thidell 2008, p. 36).

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1 The national bodies give somewhat different accounts by merging or splitting some product groups, display lists of chemicals as criteria documents and include old or not yet settled product groups.

2.4 Theory and framework

The objective of this thesis research was not to conduct a comprehensive evaluation of the Swan as a policy instrument, but to examine its effects. This is also a key element in traditional policy evaluation. The direct effects of the Swan and other eco-labels have been the subject to several evaluations. This thesis author refers to Paper II for a comprehensive analysis of seven effectiveness evaluations of European eco-labelling schemes. The indirect effects of eco-labelling have, however, still not been subject to the same comprehensive evaluation.

The theoretical foundation of eco-labelling as a policy instrument was analysed by Boström and Klintman (2008) and Rubik and Frankl (2005). They based their analyses on the rationale for eco-labelling and the environment of the eco-labelling schemes and placed it in societal discourses and theories. These theories do not analyse the effects of eco-labelling, as such, rather they explain how eco-labelling schemes have emerged and in a broad sense expound upon the societal interactions that have influenced their development. Those approaches are not further addressed in this thesis, except for the discussion of the functions of eco-labelling and its contribution to sustainable consumption and production, which fits well into the ecological modernisation discourse. Instead, it was deemed necessary to build upon the literature on evaluation theory in order to establish a framework suitable for the analysis of the effects of eco-labelling. Traditional evaluation literature has a focus on intended effects limited to goal-achievements, effectiveness and efficiency of the intervention. An analytical framework suggested by the US EPA (1994, pp. 5-8) is often cited and applied for such effectiveness studies. In the case of eco-labelling, goals and objectives are, however, often vaguely described, and thus, require other or additional analytical frameworks. The evaluation research literature frequently uses the concept of side-effects for indirect effects, see for instance Vedung (1997, p. 49).

Even the most simple cause and effect chain, for instance, guiding consumers to choose environmentally preferable products and thus, to stimulate a market drive, has a number of micro steps that make the causality relations unclear. Referring to the overarching objectives of the Swan; to contribute to sustainable consumption and production (SCP), decrease consumer confusion etc., and by including observed, anticipated and other indirect effects, the picture becomes even more complex. A

pattern of actors, relations, influences and actions, emerges that should be viewed in relation to implicit and explicit objectives.

By analysing the causal links and the outcomes, this thesis author worked to contribute to the understanding of effects and the interplay between eco-labelling and behaviour of the actors. Intervention theory was selected for the use in this thesis, since it includes all these intermediary effects or outcomes that occur or may occur when a policy instrument is introduced and implemented.

2.4.1 Background and rational for intervention theory

Vedung (1997) reviews the ideas behind intervention theory concept and its evolvement inspired by several authors (pp. 138-139). According to Mickwitz (2006), the concept was re-vitalised in the 1990s when intervention theory became a central topic in the discussion on evaluation methods (p. 32).

Information and informative policy instruments were examined from theoretical perspectives by Vedung and van den Doelen (1998), both from their own merits and in relation to administrative (or regulatory) and economic instruments. They further discussed the effects of information programmes from the catch-phrase 'first there are effects and then there are effects'(p. 115), that differentiate between intended effects, side (indirect) effects, and other effects (null, perverse) and conclude that side-effects are rarely discussed in evaluations. Moreover, they state that most evaluations of information programmes concern knowledge (about) effects, and little effort pertains to attitudinal changes and to changes of peoples' behaviour observed in more or less experimental settings (p. 18).

Measurements of direct effects, or effectiveness in the meaning of impacts caused by an intervention, contributing to achieving its specific and general objectives, are often the subject for environmental policy evaluations. Along that line, Mickwitz (2006) stated that evaluations are necessary for the policy formation processes, and a fundamental requirement of transparent and democratic processes in the society. This is, however, not enough, Mickwitz argues, and advocates evaluations going beyond mere effectiveness assessments. He indicated that traditional goal-achievement models for evaluations are too limited since they do not include side-effects (Mickwick 2003, p. 27). Only then can meaningful inputs to the deliberation of merits,

worth and value of a policy intervention be provided through evaluations, which Vedung (1997, p. 3) highlighted as the key task of an evaluation.

The act of balancing the search for intended effects and side-effects in conjunction with problems associated with the lack of standardised methods and indicators for measuring the effects is also addressed by Vedung (1997, pp. 49-59). Furthermore, the side-effects can be either anticipated or unanticipated effects both inside and outside the scope of the target area, which should be viewed as the actors targeted by the intervention. These effects can be described in qualitative categories. This somewhat complicated division of effects, suggested by Vedung (1997), is illustrated in Figure 2-2.

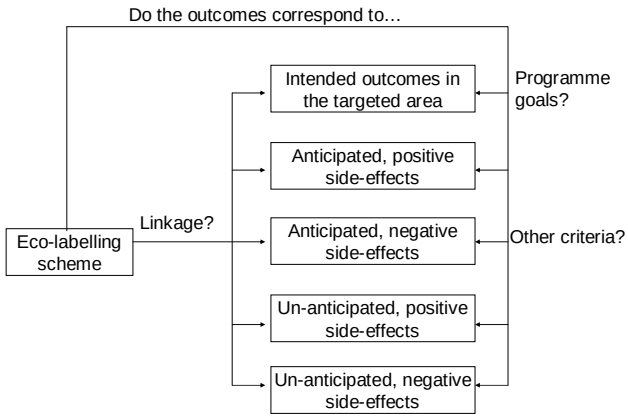

Figure 2-2. Division of effects and side-effects (adapted from Vedung (1997, p. 58))

The evaluation approach has the aim to show how an intervention has been implemented and what effects it has had in practice: "the role of intervention theories is to describe how a policy is supposed to be implemented and function. Intervention theories are not descriptions of how an intervention actually works, but rather to be used as a tool in the evaluation process in order to assess the actual implementation and the effects the policy has had in practice." (Mickwitz 2006, p. 33). Thus, intervention theory is used as a tool since it has two important functions: to establish and to examine anticipated and unanticipated direct effects and side effects in and outside the target area for the intervention, and to guide data collection and analyses (p. 34).

By analysing these causal links and the outcomes, this thesis author worked to contribute to the understanding of effects and the interplay between eco-labelling and behaviour of the actors.

Intervention theories have been proven to be useful in similar settings. For instance, Tojo (2004) employed intervention theory to analyse the effects of extended producer responsibility (EPR) systems in the electronic and automotive industries, which in terms of several and unclear effects and multiple objectives, have similarities with eco-labelling. She demonstrated the difficulties in measurements and that proxies and qualitative evidence had to be used for the evaluation.

An interesting aspect of the application of intervention theory is that several theories can exist in parallel as a consequence that different stakeholders' have contrasting assumptions and expectations about the intervention's impacts. This feature was highlighted by, for instance, Leeuw and Vaessen (2009). Different intervention theories can either be combined through negotiations, or can be tested separately.

2.4.2 Building the intervention theory

According to Mickwitz (2003), the core elements of an intervention theory are actors, inputs, outputs, and outcomes and the links between/among them. These core elements of intervention theory are described as:

- Actors: agencies as the implementing body of the policy instrument, focus upon addressees that are targeted by the instrument;
- Inputs: resources such as personnel, finance, matters that the implementing body use including information;
- Outputs: matters the addressees are faced with;
- Outcomes: actions taken by addressees because they are faced with the outputs, but also the consequences of these actions. The outcomes are sub-divided into immediate, intermediate, and ultimate. Supplementary terms in use are impact (outcome), result (both output and outcome) and effect (outcome in both the target area and as side-effect)

In the simplified case, an intervention theory adapted to a governmental intervention, as illustrated in Figure 2-3, is identical with a traditional effectiveness model of causes and effects, and reflects the prime goals of the

intervention. This is at least valid, if or when the final outcome can be detected and related to the intended goals or objectives of the intervention.

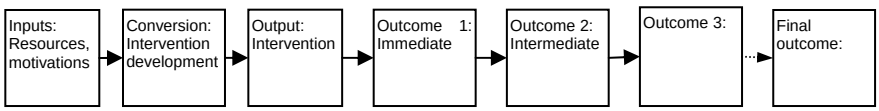

Figure 2-3. A system model adapted to governmental intervention evaluation (adapted from Tojo (2004) and Vedung (1997, p. 5))

This simplified model does not, however, regard any other effects than the intended. Thus, there is a need to expand the scope of the model and consider side-effects and other effects that somehow relate to the objectives of the intervention.

Moreover, when examining an intervention, there is a need to consider the criteria for the evaluation. Bemelmans-Videc (1998, p. 9) elaborates on the criteria of good governance in policy intervention and mentions legality and democracy as central values, beside the generally requested effectiveness and efficiency criteria. However, other criteria can be considered due to the purpose of the evaluation. In recent years, Finnish environmental policy evaluation research has addressed these matters. Mickwitz (2006, p. 30) suggested in his doctoral thesis also relevance, flexibility, predictability, persistence, efficiency acceptability, transparency, participatory rights and equity, but adds that these are far from the only ones. The selection of evaluation criteria is based on the evaluator's normative judgements.

Since this is an analysis of the effects and not an evaluation of the intervention as such, just a few of the evaluation criteria related to application and perceptions of the effects (impacts) are addressed. The intention of this thesis author was to discuss the effects from the traditional criteria of effectiveness, which is a combination of goal-achievement and attributability. The relevance and legitimacy (acceptability) are important for the perceptions of and willingness to utilise features of eco-labelling and thus, to develop new outcomes. In addition, they are, together with the legality and democracy criteria, closely related to the essential aspects of credibility and trustworthiness of an eco-labelling scheme. The general model presented in Figure 2-4 indicates the relations among the

intervention, its needs and outcomes and their inter-connectedness to the selected evaluation criteria.

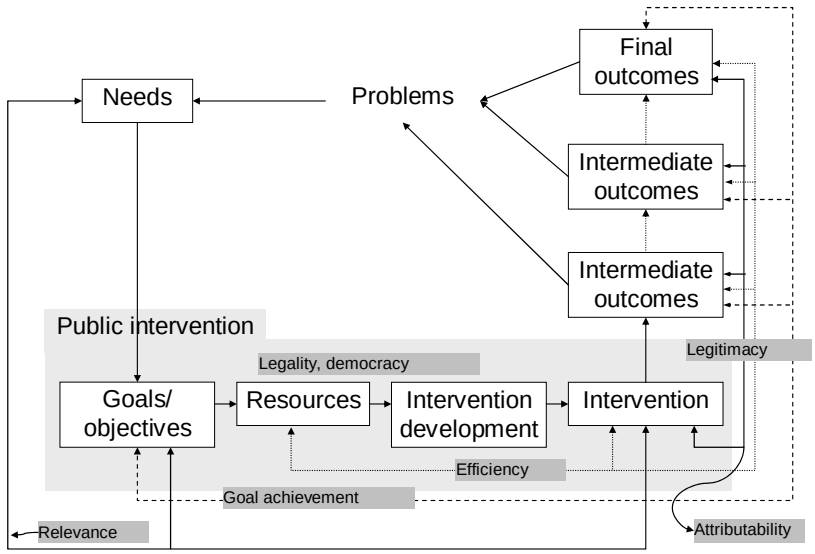

Figure 2-4. General evaluation model with relationships between effects and selected evaluation criteria (adapted from Tojo (2004) and Hildén et al. (2002))

2.4.3 Application of intervention theory

In this section, the intervention theory is explored for its potential effectiveness evaluation of the topic of this thesis, namely eco-labelling and eco-labelling schemes as an intervention.

The simple cause-effect chain in Figure 2-3 represents anticipated effects in the target area of the intervention. In the first step, that generic model is connected to the pre-mentioned evaluation criteria, which is illustrated in Figure 2-4. The outputs, the eco-labelling scheme and the criteria document it produces, are for simplicity, grouped together as the 'public intervention'. The anticipated outcomes from the eco-labelling scheme are represented along the right vertical axis where they are related to the selected evaluation criteria.

The criteria of legitimacy, relevance, attributability, goal achievement and relevance will be examined to some detail since they are closely connected to the effects generated by the scheme. The efficiency criterion is discussed, to a certain level, in relation to typical evaluation questions such as, is eco-

labelling worth the resources put into the scheme. The criteria of legality and democracy are also commented upon because they play important roles in building credibility.

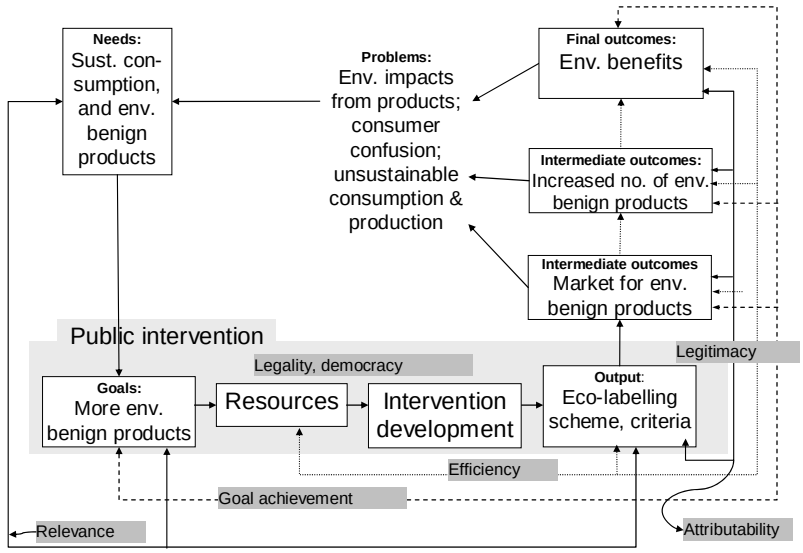

Figure 2-5. A model for the evaluation of an eco-labelling scheme based on intervention theory

In the second step, the intervention theory was constructed. It was stated earlier that the target area is viewed as the actors influenced from the cause-effect of the outputs and intermediary outcomes of the actual intervention as described in Figure 2-5. That generic model can be elaborated to include the actors and how their anticipated reactions to the outputs and intermediary outcomes are generated by the eco-labelling scheme.

This elaborated model includes the intended dynamic loop of continual improvements of products as illustrated by consumers who buy eco-labelled products that sends signals to other producers to modify, re-design or innovate their products in order to provide the demanded products and, moreover, being able to adapt to revised requirements in updated criteria documents. The actual causalities are further elaborated in Figure 2-6. It gives an idea about the anticipated micro-step effects necessary in order to cause the intended final outcomes, reductions in negative environmental impacts.

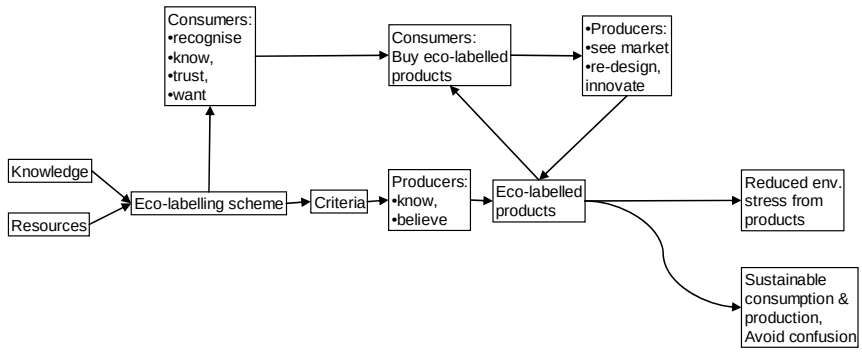

Figure 2-6. Elaborated and dynamic cause-effect chain including anticipated micro-steps for direct effects in the target area of eco-labelling

It should be underscored that the prime focus of this thesis is to examine all relevant effects caused by the output-outcome and outcome-outcome relations of eco-labelling. To capture all possible anticipated and unanticipated effects is a complicated task, also in the case of eco-labelling. Not least, as this thesis author acknowledges, unanticipated effects only partially can be included in advance, because they primarily evolve as the process progresses.

It should be acknowledged that negative effects are not explicitly covered. It is explained by the simple fact that the eco-labelling scheme is voluntary and those who perceive negative effects simply do not participate. Some potential negative effects, such as hindering innovation and causing extensive bureaucracy are anti-theses to the positive effects and therefore are covered under these headings. Negative effects from trade agreement violation etc. are not within the scope of this effect analysis but could be included in other intervention theories for eco-labelling.

The intervention theory for the Nordic Swan illustrated in Figure 2-7 was developed from the direct effects, experiences, and literature findings on anticipated indirect effects in a procedure where various combinations and logics were tested. The actors and intermediary outcomes leading to or towards the ultimate outcome, the goal of eco-labelling, consist of several steps that can be described and measured differently. In order to study the side-effects (indirect effects), an actor perspective was selected, because that was the starting point for the identification and characterisation of the effects.

The current intervention theory was derived from the actor-based compilation of indirect effects presented in Table 4-1. The compilation builds on literature findings comprised of suggested and empirically demonstrated indirect effects. Hence, these indirect effects include both anticipated and unanticipated side-effects.

The theory serves as background for the further analysis and description of direct effects (anticipated effects in the target area) and anticipated and unanticipated indirect effects (side-effects). The indirect effects are not divided into inside and outside the target area due to somewhat unclear demarcations.

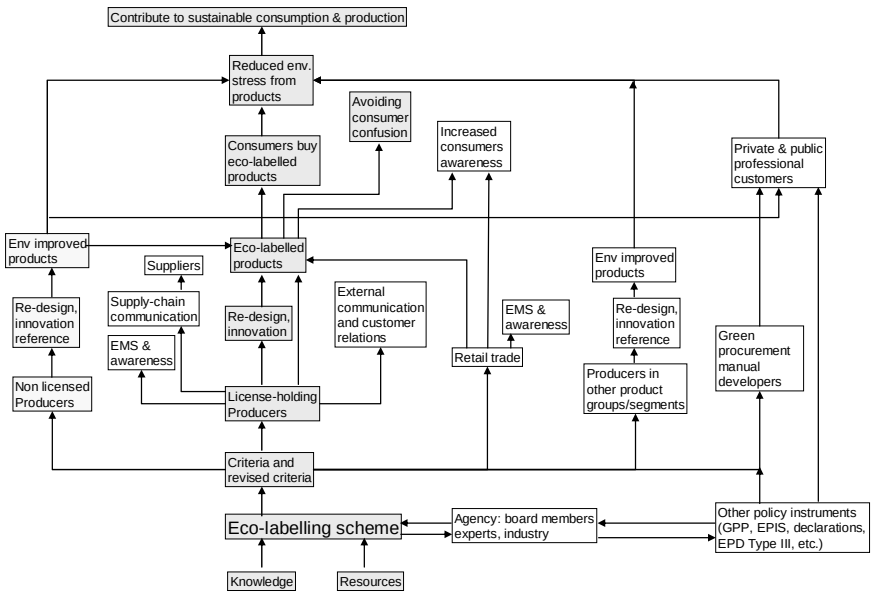

Figure 2-7. Intervention theory for the Nordic Swan developed for the effect analysis. Shaded boxes indicate the direct effects in the target area of intervention.

CHAPTER
THREE

3. Direct effects

3.1 Introduction to direct effects

There is long path between the launch of an eco-label and actual environmental improvements of products and of the state of the environment. Four core conditions must be fulfilled for the eco-label to actually have such direct effects:

- Criteria that distinguish environmentally superior products from the bulk within a defined/given product group;
- Consumers willing to be guided by the eco-label, and to change their buying behaviour in favour of eco-labelled products;
- Producers willing to verify that their products meet the requirements of the eco-label, or to modify their products to meet them;
- Criteria that are regularly upgraded.

The idea of eco-labelling implies a number of steps in the chain of causes and effects from an eco-labelling scheme issues a criteria document to a reduction of the environmental pressure from the design, manufacturing and use of a product. At certain points, these direct effects can be measured or described, at others, desirable effects are difficult to measure and, instead, must be approached by proxies.

This chapter builds on the appended Paper II. In that paper, major effectiveness evaluations of European eco-labelling schemes are examined in order to analyse the direct effects of the selected schemes. The paper also gives comprehensive account of applied methods and analytical frameworks, as well as, the most important studies and relevant publications. In this chapter, the most important findings and conclusions from that paper are presented.

3.2 Consumer effects

There could be many reasons for consumers to seek guidance from eco-labels. This thesis author does not explore the reasons behind certain consumer behaviours, since that could be a thesis by itself. It should, however, be stated that altruistic reasons for saving the environment are accompanied by more egoistic reasons that underlay their 'belief' in eco-labelled products as being better for the user (Grolleau, Ibanez and Mzoughi 2009).

Most studies measure, through conventional consumer surveys, the share of a sample population that recognises the eco-label among many other labels and symbols. These kinds of studies often measure if the respondents know what the labels and symbols mean, and if they are perceived as being trustworthy.

Recognition is, without doubt, important, as a label that is not known cannot cause any direct effects. On the other hand, mere recognition of the label is not enough since it could also be mixed up with other labelling schemes. Thus, studies on the interpretation of the label are important, but are more complicated to conduct. In surveys, respondents are often asked to express their interpretations of the meaning of the label, or to mark it from alternatives in a multiple-choice questionnaire. The researcher must either interpret the answers of the respondents to gauge the level of understanding or pre-select such alternative answers reflecting levels of understanding when constructing multiple-choice questions. Consequently, the design of the questionnaire may make different studies difficult to compare over time or between studies, or as in the case of the Nordic Swan, when studies are conducted in different countries. In the reports examined and reported on in Paper II, there are alternative expressions; such as 'related to the environment', 'environmental-friendly product' and 'official Nordic eco-label', used as indications of various levels of knowledge of the Swan. One could ask if all respondents understood the alternatives in the same way and viewed these alternatives as clear-cut and distinct.

Since the eco-label per se does not convey detailed information, the credibility of an eco-labelling scheme is its essential asset.[2] Few people would actively use the label if they do not trust it. Thus, consumer studies often include questions through which respondents are asked to rank the

[2] The credibility attributes of food-labels were examined in Paper III.

credibility of various labels. Since the answers and the interpretation of answers is crucial for the results of the studies, the design and coding of answers is key for making comparisons between/among studies and schemes.

Other measures of consumer appreciation of the eco-labels address the use and purchase of eco-labelled products. The easiest but crudest measurement method of addressing consumption is consumers' knowledge of eco-labelled products. However this measure does not document actual purchases and use. Instead, consumer surveys request for information pertaining to the frequency of the respondents' purchases of selected eco-labelled products. When asked about their purchases, consumers often overstate their inclination to buy eco-labelled products, which was elegantly documented by Björk (1997).

Consumers are sometimes asked to what extent they are willing to pay a premium for eco-labelled products, which is called the willingness-to-pay factor. Most 'willingness-to-pay' studies have been conducted as consumer surveys or focus group studies. These methods are fairly straightforward and deliver numeric values. However, since there is no obligation to substantiate answers, this kind of study often shows positive biases (US EPA 1994, p. 19).

However, one Danish study presented in Bjørner et al. (2002a; 2002b), builds its analysis on solid empirical data from actual purchasing behaviour changes over two years. It demonstrated that Danish consumers were willing to pay 10-17% higher price for eco-labelled tissue paper and household detergents.

One method to study consumers' purchasing habits is via the use of panels run by commercial market research institutes. The disadvantage of such panels, for the purpose of research is that the studies are devised and designed to fit the needs of their clients, which are market actors not necessarily keen on learning about consumers' purchasing habits of eco-labelled products. Someone has to pay if that aspect should be included. However, results from such studies may occasionally be made publicly available and can provide important indications of the market attractiveness of the eco-labelled product(s).

The real measure of consumer appreciation of the eco-labels is to determine to what extent the labelled products gain market shares. Measurement of

such changes in market shares has the following data collection problems: (a) how to define the market, (b) how to retrieve data or estimations of the size of each product group's market, and (c) how or from whom can or should data on the eco-labelled market share be obtained? Some of the studies give account of estimations of market shares, but few actually present real figures for certain product groups provided by retailers. However, data availability and data quality may vary substantially between product groups and lack of data does not necessarily mean insignificant sales. Thus, the picture of actual purchase behaviours and market shares is incomplete. The published data suggest significant differences between/among product groups (Paper II; Aalto, Heiskanen, Leire and Thidell 2008, p. 52).

When the Swan was launched as the 'official' eco-labelling scheme, one reason was to avoid consumer confusion caused by the multitude of claims and unsubstantiated logos that occurred in the market in the 1980s. However, to some extent, the confusion is still considered to be present, but now it is more due to the large number of different eco-labels and eco-labelling like systems that deal with certain environmental features of the product. In Paper I, in contrast, it was reported that Nordic consumers generally know of the main labels, including the Swan, they appreciate and use them (when using any) and overlook most others. The confusion issue has been diminished, or maybe it was never as significant as some people assumed. The study also found that health perceptions were important for many consumers when choosing eco-labelled products.

Concluding remarks: Over time, the Swan has gained high consumer recognition in the Nordic countries. Most people appear to know what it means, though if asked, they will express it in different ways, and they view the Swan as credible or very credible. There are also studies, which have documented that consumers are actually willing to pay more for eco-labelled products. It appears, however, that the use of the Swan is overstated or over-interpreted when consumers are surveyed. In order to better understand how the Swan is used in the purchase situations, it was suggested in Paper I that the measurement methods need to be reshaped and moved closer to the purchase decisions in the shops.

Obviously, far from all market share information is publicly or readily available. In addition, the 'available' market share figures are spread among many hands for the various product groups. Often, the data are of very

different quality; consequently, they are not truly comparable with official information.

3.3 Effects on producers

There are two kinds of direct implications for a producer who wants to be awarded the eco-label for his/her product: (a) verification and licensing of existing products that meet the requirements of the product group criteria, and (b) realisation of necessary product modifications to meet the criteria requirements. The fact that a producer is asked to comment on criteria proposals in an open stakeholder consultation process can be interpreted as a complementing action, since it offers access to early information on future requirements.

Traditionally, producers' willingness to apply for the eco-label is measured as the number of licences issued in each product group. In most evaluations, the data are given in absolute figures, rarely as changes over time, or changes after the criteria have been revised. This measure reveals, however, little about the dynamics of the product development processes. Information on how many producers that comply and are willing to apply for the licence is an indication of an eco-label's market attractiveness.

In the assessment of the Blue Angel in 1998, a questionnaire survey was conducted among licence holders, asking for information about whether the eco-label had implied any environmental improvements of their products. Despite the somewhat ambiguous answers to that question, the licence holders also explained that their product development was oriented by the criteria. The real product improvements followed the criteria revisions (Häβler, Mahlmann and Schoenheit 1998). The EVER (2005) study found from their licence holder survey that the EU Eco-label had contributed to setting environmental targets (p. 92) and helped to catalyse producers' reductions of emissions (p. 91).

However, questionnaires do not necessarily give comparative information on real changes. In the two assessments, the producers would primarily base their answers on their perceptions of changes and environmental gains. Those studies documented, for instance, the share of licence holders who had to make changes and to what kind(s) of modifications.

From many interviews and discussions with representatives of licence holding companies, eco-labelling practitioners in the Nordic scheme and various other stakeholders, it is clear to this thesis author that there are many companies, which have actually made changes in order to comply with the criteria. Not least, in parallel with the development or revision of the product criteria. Interviews with people involved in the development of the first 'fine paper' criteria of the Nordic Swan reported that most producers went through general and rapid improvement processes of their environmental performances before the requirements finally were set. Similar patterns emerged in the detergent, insulation material and building board industries when the criteria were developed (See Paper IV for details).

Yet, knowledge is lacking concerning the producers' organisational learning from the licensing process, for instance, how are requirements channelled within and responded to in the company and to which corporate function(s) is the responsibility for responding to the product criteria given? For the sake of deeper understanding of the dynamics of the change processes such knowledge would be valuable.

3.4 Environmental benefits

It has been demonstrated that, only to a very small degree, have the direct environmental effects of eco-labelling schemes been quantified in a systematic way. A scarcity of established and effective methods is a crucial reason for this. A few attempts have been made, but so far, only Wilske (1999) has conducted a systematic and comprehensive quantification of environmental benefits for products in one individual product area of cleaning agents and household detergents. That study found that comparable data for the situation at the evaluation points are difficult to obtain. Based on her approach, an embryo of a method is outlined in Paper II, but this method is dependent on the conditions for obtaining good historical environmental performance data of the products in question.

In the effect evaluation of the Swan in Heidenmark, Jönsson, Lindhqvist and Thidell (2001), it was concluded that the eco-label had influenced the environmental performance; in particular for household detergents, printing paper and printed matter. The printing industry is an interesting example of an industry with considerable demonstrated environmental benefits. The print shops that applied for the licence to produce Swan-labelled printed matter had to report production changes to the secretariats. Thus, it could

be established that process modifications occurred, but also that the suppliers were influenced. In addition, when the criteria requirements were revised, most of the print shops stayed with the Swan and chose to adapt to the new requirements (Heidenmark, Jönsson, Lindhqvist and Thidell 2001). Encouragingly, after the product groups had been re-defined from addressing the printed matter to print shops, as well as revised, the producers remained with the eco-labelling (Aalto, Heiskanen, Leire and Thidell 2008).

Most studies on direct environmental effects conclude on realistic grounds that the effects are present when a reasonable amount of eco-labelled products are sold, given that the criteria are sufficiently good. These proxy-based detections of real effects were used in several evaluations (Paper IV; Backman, Lindhqvist and Thidell 1995a; Häβler, Mahlmann and Schoenheit 1998; Heidenmark, Jönsson, Lindhqvist and Thidell 2001).

There are many studies and claims of potential environmental benefits from eco-labelling based upon assumptions on differences in environmental performances and sales of the products, and, thus, largely theoretical calculations. Despite the lack of empirical evidence, these calculations of potentials are more than merely academic exercises, since they, to a certain degree, indicate an upper limit for the types and magnitudes of direct effects that could be gained.

A problem with all reports on gained or potentially gained environmental effects is that they cannot isolate the direct effects of the eco-label from effects from other policy instruments or from general societal changes in attitudes and values. That is, there is an attributability problem connected to the evaluations. This is further discussed in Chapter 5 of this thesis.

3.5 Inherent limitations of eco-labelling

In a strand of the discussion related to effects, or rather lack of effects from eco-labelling, various authors discuss issues pertaining to how product groups should be selected for the criteria development. One avenue of the critique pertaining to exclusion of 'strange' product groups, which have relatively little impact upon the environment; for instance, closed toilet systems, coffee filters and flooring (ÅF-IPK 2000a), and birdhouses (Morris 1997). Another set of observations pertains to the lack of eco-labels on product groups of high environmental significance, such as food and

transport (ÅF-IPK 2000a). It should, be mentioned that GEC has criteria for the two product groups freight and passengers transport. The conclusion of ÅF-IPK (2000a) is that eco-labelling cannot significantly reduce the man-made environmental impacts because it does not address the most significant sectors of anthropogenic impacts.

One explanation for these observations is that there are inherent limitations of eco-labelling. Many products on the market are simply not suited for eco-labelling. There must be significant differences in environmental performance between the products in the product group, since eco-labelling distinguishes environmentally superior products from the bulk of products in that category. Especially, because such labelling is a market-based approach, there must be sufficient competition within the product group, and since it is voluntary, there must be producers expecting benefits from using it. The Nordic scheme selects product groups based on their environmental *relevance*, *potential* to make environmental improvements, and *steerability (control)* expressed as the Swan's ability to cause market changes (Nordic Eco-Labelling Board 2001). Thus, direct environmental benefits can only be expected in those aspects that are related to product groups suitable for eco-labelling and only for product groups that have attracted a significant number of licence holders.

The direct environmental benefits of an eco-label are restricted to reductions/improvements of the aspects governed by the criteria documents. Since it is a matter of singling out the top-performers in each product group, drastic reductions in environmental burden from most product groups should not be expected. Rather, eco-labels address the incremental improvements needed in the everyday work.

The environmental aspects addressed in the eco-labelling criteria are based on life cycle considerations. However, all requirements must be verifiable in the certification and licensing process. Aspects occurring downstream, mainly during the usage and end-of-life phases are more difficult to steer and control. However, there may be special requirements that information is made available to the user on the package or that disassembly manuals are provided to dismantlers.

The dynamics in the criteria revision process primarily considers environmental performance improvements that can be directly accomplished in the product group. It is sometimes mentioned that criteria requirements could be set so stringent that no product could meet them

immediately, in order to stimulate innovation or product development, but there is, until now, no such successful example reported. The performance improvements stimulated by criteria revision are predominately a matter of upgrading of today's products. From a general perspective, the criteria revisions aim at incremental or cumulative improvements.

A further limitation, often named the 'black product' issue, is related to the credibility of the scheme and public perception of eco-labelled products as 'environmentally friendly'. The latter is slightly different from top-performers in a defined product group. The black products may be products that have become general symbols of environmental problems or some aspects related to them are severe, and those products should, therefore, not be associated with an eco-label, even if there are significant potentials for performance improvements. Some examples of products that have been considered as 'black' are cars and household pesticides. In the Swedish eco-labelling board, car-care cleaning products were discussed as a potential 'black' product group, but the proposal to exclude them was rejected. There is apparently a diffuse border for characterisation of black products and the competent body has to judge product groups, case-by-case.

Finally, eco-labelling is not a tool that suggests what kinds of products to buy and what to avoid in a deeper sense of sustainable consumption. The label only points out the best ones within a product group. It does not influence the total volume of consumption.

3.6 Summary of direct effects

Eco-labelling can gain consumer recognition and credibility. In some cases, it has also been demonstrated that consumers have been willing to pay a price-premium for eco-labelled products. It has further been shown that eco-labelled products have gained significant market shares in some product groups and had no or only very small market impacts in others. In general, market share figures are difficult to obtain. Both the number of issued licences and producer interviews indicate that producers do make changes in order to meet the eco-labelling criteria. The extent and magnitude of environmental improvements have, however, been difficult to assess but the existence of such improvements have been documented. The total possible improvement potential of eco-labelling can be assumed from what product groups are found to be suitable for eco-labelling.

CHAPTER
FOUR

4. Indirect effects of eco-labelling

4.1 Background to indirect effects

The indirect effects are challenging to identify from the literature due to inadequate definitions, which make key-word searches difficult to do. A lack of clear and solid methods for approaching and researching the indirect effects is also a challenge. Among examples found in the literature, there are only a few empirically documented cases. There are, on the other hand, more examples of anticipated indirect effects mentioned in the literature.

The notion of indirect effects from eco-labelling is far from new. Such effects were already suggested in 1995 and are reported on within Paper IV without being referred to as 'indirect'. That referred to general awareness raising for environmental issues related to products and consumption, as well as provision of guidance and drivers for producers of non-labelled products as being among the indirect effect.

One of the first serious attempts to address indirect effects from eco-labelling was included in the second evaluation of the Nordic scheme in 2000 (Heidenmark, Jönsson, Lindhqvist and Thidell 2001). The report described them as "spillover effects from eco-labelling criteria on non-labelled products, procurement guidance and consumer awareness". In particular, indirect effects among stakeholders like producers, retail trade, professional customers, and private consumers were analysed. The indirect effects had been implicitly demonstrated already in the examination of environmental information flows in product chains in Heiskanen, Kärnä, Niva, Timonen, Munch af Rosenschöld, Pripp and Thidell (1998). Later on, this thesis author and colleagues examined synergistic effects between the Swan and other EPIS and EMS (Edlund, Leire and Thidell 2002). The nature and types of influences of indirect effects were further addressed in the paper by Leire and Thidell (2005a). They used the actual indirect effects as starting points rather than working with the stakeholders.

In the EVER study from 2004, the concept of 'indirect environmental benefits' was defined as "environmentally positive impacts induced by eco-labelling schemes on surrounding policy, business and society" (EVER 2004). In other literature sources, concepts like synergistic, secondary or spill-over effects were used instead of indirect effects. Cadman and Dolley (2004) identified through a hearing process, nine such indirect effects, which are included in Table 4-1.

In Chapter 4 of this thesis, indirect effects leading to environmental benefits are described and analysed. The contributions of this thesis author to the research on indirect effects are to be found in: Backman, Lindhqvist and Thidell (1995a), Backman, Lindhqvist and Thidell (1995b, that is Paper IV), Heiskanen, Kärnä, Niva, Timonen, Munch af Rosenschöld, Pripp and Thidell (1998) (this report is referred to as Heiskanen et al. (1998) in the remainder of this thesis), Heidenmark, Jönsson, Lindhqvist and Thidell (2001), Edlund, Leire and Thidell (2002), Leire, Thidell, Helgadottir, Gislason, Pylvänäinen and Niva (2004), Leire and Thidell (2005a), Aalto, Heiskanen, Leire and Thidell (2008), Thidell (Paper II), and Leire and Thidell (Paper V). Many of these studies were conducted and reported without the concept of indirect effects of eco-labelling in mind. Thus, the compilation in Table 4-1 has been derived from these studies and relevant literature findings and served as input when the theory of an eco-labelling intervention presented in Section 2.4.3 was being developed.

Table 4-1. Compilation of indirect effects as anticipated and unanticipated side-effects

Actor influenced by the indirect effect	**Nature of indirect effect**	**Reference**
Industry sector, or part thereof	Industry standard of environmental excellence.	2,4,8
	Nominator for entire sector/product group.	2,6,7,8
Licence holding producers	Pressure on entire product group.	2,4
	Improved performance of non-labelled products and product groups not open for eco-labelling.	3,4
	Environmental management and process improvements, increased environmental awareness among staff.	3,4,5, 8,9
	Improved image and relations with supplier and customer.	3,4,8, 9,10

Non-licence producers in eco-labelled product groups	Criteria used as benchmark, used for re-design of non-labelled products.	6,7,8,12
	Knowledge on expected market demands.	
Producers outside the target area	Peer pressure.	1,4,8
	Knowledge transfer to non-labelled product groups.	3,12
Private consumers	Increased general awareness of sustainable consumerism.	1,5,8
	Encouragement to buy other eco-labelled products.	4
	Common information campaigns.	7
Professional purchaser in public and private organisations	Private and public purchasers use the criteria for setting requirements and use the eco-labels as verification.	4,6,7,8, 9,11
	Availability of eco-labelled products as market indication of green products on the market.	9
Green procurement manual developers	Using criteria as input for selecting product groups and phrasing requirements.	Paper V, 8,9
	Using measurements methods, and verification methods.	
	Indicator of availability of environmentally benign products.	
	Knowledge transfer to other product groups outside the eco-label. Share information sources.	
Retail trade	Use the eco-label as quality parameter.	2,3
	Internal environmental work and awareness.	2,3,4
Supply-chain actor	Eco-labels as consensus-making instruments.	2
	Enhanced understanding of environmental issues, eased communication.	2,4,5,6
Other Eco-labelling schemes	Common criteria development, co-operation, harmonisation, sharing knowledge and information.	6,8,9, 10
Other EPIS schemes	Same information used for several EPIS, requirement inclusion.	5,6,7,8,9
Policy-makers	GPP.	2,3
	Product standards, benchmarks/'New approach'.	6
	EuP and similar directives.	6
	Reduced VAT.	6

1: Backman, Lindhqvist and Thidell (1995a), 2: Heiskanen, Kärnä, Niva, Timonen, Munch af Rosenschöld, Pripp and Thidell (1998), 3: ÅF-IPK (2000b), 4: Heidenmark, Jönsson, Lindhqvist and Thidell (2001), 5: Edlund, Leire and Thidell (2002), 6: Cadman and Dolley (2004), 7: Schisser and Shinn (2004), 8: Leire and Thidell (2005a), 9: Aalto, Heiskanen, Leire and Thidell (2008), 10: Häβler, Mahlmann and Schoenheit (1998), 11: GRIP (1997), 12: EVER (2005)

4.2 Vehicle for increased consumer awareness

One key role of eco-labelling highlighted by Backman, Lindhqvist and Thidell (1995a) is to raise the general awareness of environmental issues related to products and consumption. The statement was supported by an observed prominent use of the eco-labels in newspaper articles and the annual 'green consumer's week' organised by NGOs and consumer authorities, where it was used as a vehicle for conveying more complex messages.

Some representatives from the retail trade groups interviewed for the evaluation of the Swan in 2000 conveyed a perception that the presence of eco-labelled products had such an awareness raising effect, even if the signal was not clear-cut (Heidenmark, Jönsson, Lindhqvist and Thidell 2001).

In the EEB evaluation of the EU Eco-label, an explicit criterion was the suitability of the selected product groups for NGO campaigning, which is interpreted as a straight connection to this indirect effect (Schisser and Shinn 2004).

Concluding remarks: The Swan is clearly used in various general information materials on environmental aspects of consumption. There is, however, no empirical evidence of increased general awareness on sustainable consumerism from eco-labelling. The current information is based on insights obtained from interviews with representatives from the retail trade. However, it is reasonable to believe that there is a combined effect because the eco-label is used in campaigning in all of the Nordic countries. The Swan occurs in information materials in conjunction with such messages. However, this entire area should be further researched and improved.

4.3 Eco-labels as guidance for professional purchasers

In this thesis, the concept 'professional purchaser' refers to people who purchase goods and services in their roles as professionals. Usally, the products are selected to be consumed, used, refined, or traded by the

organisation for which they work.[3] Professional purchasers work in both public and private organisations.[4]

Many reports show that public purchasers use eco-labels to guide their purchases. However, often the use is vaguely stated, as, 'the criteria were used when possible or relate to direct use or buying eco-labelled products.'

In the evaluation of the Swan in 2000, many interviewed public purchasers claimed it was easier to establish and require environmental demands upon the product suppliers when eco-labelling criteria or labelled products could be used as a basis for establishing the level of demands. Almost all purchasers found that the eco-label increased the knowledge about environmental impacts of products, the general awareness, and had a positive effect on environmental communication. The eco-labelling criteria served as important reference points, and in a few product groups, they even established a *de facto* standard (Heidenmark, Jönsson, Lindhqvist and Thidell 2001).

In Paper V it was demonstrated that public purchasers rarely use eco-labels in the same way as private consumers. Most tendering, at least in the EU and Nordic countries, could not request a certain eco-label due to legal restrictions. Instead, they used selected criteria requirements as product specifications. A drawback evolved that many purchasers lacked the capacity to verify or control producers' claims on environmental performance in the way eco-labelling schemes can do. It was found that professional purchasers sometimes used the range of eco-labelled products in a product group subject for tendering as an indication of availability of environmentally benign products and thus, as a test to determine whether there are practical opportunities to sharpen the environmental requirements on these types of products.

The study by Heiskanen et al. (1998) clearly showed a discrepancy in preparedness and understanding of environmental issues between product chains primarily aimed for the professional and the private markets. For

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[3] Ordering large infrastructure works, housing projects and alike are set aside in this discussion since it goes far beyond the relevance of eco-labelling.

[4] 'Green public procurement' (GPP) is the policy instrument to enhance the demand for environmentally benign products. 'Green procurement' is the professional act of searching for and purchasing environmentally benign products, which can be supported by the help of 'green procurement manuals', both in public and private bodies.

instance, there was in the product chain for furniture very little environmental information exchange reported in the industry providing consumer goods, while environmental requirements specified in the criteria document for the product group furniture and fittings were well known among producers serving the professional market.

Both the study by Heiskanen et al. (1998) and the findings reported in Paper V, demonstrated from document analysis and interviews with key actors, that eco-labelling criteria were used for identification of relevant, important environmental aspects and requirements when the first green public procurement manuals were developed in Sweden. The information extracted from the criteria documents was also used for environmental requirements in neighbouring product groups not subject for eco-labelling. These manuals were developed by teams, which included purchasers and environmental expertise supporting purchasers in various local and regional authorities. The manuals were designed to aid the purchasers to ask for consistent environmental information when buying the most commonly used and environmentally relevant products for their organisations.

Concluding remarks: It is clear that eco-labelling acted indirectly by both aiding purchasers and purchasing manual developers to establish the requirements, to verify compliance with the requirements and as lubrication of the information flow between suppliers and purchasers. The indirect use of eco-labelling was found to be more common than the direct use, which was restricted by both legal and practical constraints.

4.4 Influences on producers

4.4.1 Environmental pressure on entire product groups

It was reported from the evaluation of the Swan in 1995 that the process of developing criteria for 'fine paper' products contributed to a general improvement of the environmental performance of the entire sector. When the criteria document was finalised, most of the producers had adapted to the requirements and then applied for the eco-label (Backman, Lindhqvist and Thidell 1995a).

The Swan had, according to the interviewees mentioned in the report by Heidenmark, Jönsson, Lindhqvist and Thidell (2001), contributed to an increase in general awareness in some sectors, such as print shops,

household detergents, and batteries. From the interviews, it was concluded that there were different views regarding the eco-label as the driver for real environmental improvements in any sector or product group.

Both Heiskanen et al. (1998) and as reported on in Paper I, found that the major Swedish retail chains used the eco-label as a baseline for environmental performance for some product segments in their assortments. Household detergents and cleaning agents were the most important ones of these segments. Thus, these chains implicitly set a standard that addressed entire product groups or even product categories.

Concluding remarks: There are indications of the Swan criteria acting as guidelines or reference points in sectors subject for eco-labelling. These indications are clearer in product groups like household detergent and cleaning products, fine paper, printed matter/print shops and batteries. Some interviewees opposed such a conclusion and argued that the Swan has no function at all.

4.4.2 Product re-design and process modifications

The contribution of the Swan to environmental product re-design is divided into three categories of indirect effects: licence holders re-design of non-labelled products, re-design among non-licence holding producers acting within the scope of the Swan, and re-design of products outside the scope of the Swan.

According to Heidenmark, Jönsson, Lindhqvist and Thidell (2001), most printing paper, flooring and battery producers asserted they had to do no or just marginal adjustments in order to meet the criteria requirements when applying for the Swan licence. These producers used the same production lines for both labelled and non-labelled products. Thus, only small or no indirect effects were reported on the non-labelled product range. Some producers, for instance of household detergents, had separate production lines for labelled and non-labelled products but reported some spillover effects on non-labelled product formulae. However, earlier studies Backman, Lindhqvist and Thidell (1995a) and Heiskanen et al. (1998) indicated that the criteria development processes for paper products and household cleaning agents and detergents triggered dynamic processes and product development.

Moreover, Heidenmark, Jönsson, Lindhqvist and Thidell (2001) showed that a substantial part of the printing industry had the ability to offer Swan-labelled printed matter after they had modified the entire production processes according to demands of the Swan. These producers used the same processes for both labelled and non-labelled products and thereby, influenced non-labelled products as well. For instance, some companies had installed specific technical solutions to meet the criteria, for instance water treatment and mixer equipment for fixation baths, which also were used for non-labelled products.

The use of eco-labelling criteria for fostering environmental performance improvements of product groups outside the scope of the eco-labelling scheme was highlighted by Backman, Lindhqvist and Thidell (1995a) but no examples were given. This anticipated use was confirmed from interviews conducted for the evaluation of the Swan in 2000 (Heidenmark, Jönsson, Lindhqvist and Thidell 2001). They found examples of eco-labelling criteria that had influenced producers' choice of raw materials, production methods, waste management, product development and even transports choices.

Concluding remarks: There are examples, from several product groups in which licence holding producers have introduced improvements, which have also influenced non-labelled products in their ranges. There are examples of non-licence holding producers and producers outside the area of the Swan that have used the eco-labelling criteria to guide their product re-design and process improvements. The picture is fragmented and appears to vary between/among sectors and individual producers.

4.4.3 Use for industrial environmental management

This section, in which indirect or synergistic effects between the eco-label and environmental management schemes are discussed, includes but is not restricted to environmental management systems (EMSs) certified according to the ISO 14001 standard or verified according to EMAS.

The practical connections between the use of the Swan and EMS were examined in the study from 2000, but only a few indications of synergistic indirect effects were reported from the interviewees representing producers (Heidenmark, Jönsson, Lindhqvist and Thidell 2001). They highlighted some issues including increased understanding of the product's environmental impacts and practical support for building the management system. This weak, but detectable link, was confirmed by professional purchasers.

However, the messages were mixed since there were interviewees who reported no connections between the two schemes.

In Heiskanen et al. (1998) it was found that the Swan criteria were used for the identification of environmental priorities in manufacturing companies. It served as a compass when interpreting environmental policies. In 2002, this thesis author examined the environmental information hub function of the EMS and its roles and relations to the Swan (Edlund, Leire and Thidell 2002). He concluded that the two schemes had different purposes but that synergies between the two existed, such as EMS serving the role of managing the necessary information for the eco-label product changes. Case studies from three sectors studied (paint services, paper and building materials), however, revealed a mixed picture among practitioners, possibly depending on the fact that the maturity of the EMS was quite different among the sectors. Some could not see any synergies between the EMS and the eco-label and there were examples of producers who preferred to build upon the fact that they already had a certified EMS and, therefore, were selling environmentally superior products, in their marketing. Others were positive to integration; one example from the paper industry demonstrated a full integration between EMS, several Type I eco-labels and other information systems. The synergies went both ways: information from the Swan and other eco-labels was used for the design of the EMS and the EMS was used for information collection and validation.

The picture of opportunities for synergies had changed even more in the evaluation of the Swan from 2007/08. Then, for instance, the Graphic Association of Denmark used the Swan criteria for printing companies when advising member companies in designing their EMS and defining key environmental performance indicators (KEPI). The industry association had issued guideline packages for a convenient combination of the two systems (Aalto, Heiskanen, Leire and Thidell 2008). A similar approach and thus, indirectly gaining from the Swan was confirmed by Swedish printing companies, which stated that the main benefit from being a licence holder was the well-structured environmental management system (Arnfalk, Brorson and Thidell 2008).

Recently, service-oriented product groups have both increased in number in the Nordic scheme and, in particular, in number of licences issued. This is, especially the case for the product groups 'hotels and youth hostels', 'printing companies' and 'supermarket grocery stores'. The criteria for these product groups demand a structured environmental management system

although they do not necessarily need an EMS, which is fully organised according to ISO 14001, or EMAS.

Concluding remarks: licence holders in service-dominated product groups introduce structured environmental management, which can actually be regarded as a direct effect. The first examples of synergies and indirect use of eco-labelling criteria in EMS were, however, first examined in other product groups. It is therefore clear that the potential is there but is far from being fully and systematically exploited.

4.4.4 External communication and relations

The study conducted in 2000 by Heidenmark, Jönsson, Lindhqvist and Thidell indicated mixed messages on how well the Swan label could be used for external environmental communication. There were obvious differences between the Nordic countries and between industry sectors. In Sweden, eco-labelled products were necessary for good customer relations among producers of printing paper, household detergents, and batteries. The interviewees emphasised that labels contributed to putting environmental issues on the agenda and increased the information flow vis-à-vis customers. But the picture was split concerning whether contacts with contractors/ suppliers were improved because of the eco-label (Heidenmark, Jönsson, Lindhqvist and Thidell 2001).

Concluding remarks: Some licence holders perceived that the Swan label made them more visible and improved their customer relations. It was more apparent in some product groups than in others and was reported by only a few interviewees in these product groups. There are also indications from a desktop study of the EU Eco-label, that licence holders utilised the label in their information and promotional material.

4.5 Information flow in product chains

The findings on improved external communication and customer relations are somewhat connected to improved or eased environmental information flow in product chains. When downstream actors' use of the eco-label is demanded by customers, it is reasonable that upstream actors also develop a better understanding of the rationale for the posted environmental requirements of their clients.

Interviews with environmental managers in Swedish manufacturing industries in 1998 showed that several of them believed that they have progressed with environmentally sound purchasing requirements as a spin-off from implementation of an EMS or the Swan (Heidenmark, Jönsson, Lindhqvist and Thidell 1998).

Along the same line, Heiskanen et al. (1998) reported that environmental communication in the product chains, in particular in household detergents and cleaning agents, became easier since the eco-labelling criteria helped them build a common understanding of the issues among the actors. In particular, the retailers claimed they did not want to evaluate extensive information from suppliers. They preferred the eco-label as a tool to reduce their workload. The suppliers to these producers knew the criteria and what raw materials were accepted. There was also an example from the furniture chain of producers that purchased Swan-labelled particleboards as input material for non-labelled end products.

In Edlund, Leire and Thidell (2002), it was found from case studies of three sectors in the Nordic countries that in selected sectors, the eco-labels constituted one out of several information carriers in the information flow. In practice, it was hard to distinguish clear-cut roles for each of them. Rather, the interplay varied among firms, sectors, and customer demands. In the case of the Swan, it was clear that information from suppliers had to be conveyed through several tiers to the licence applicants. It was underscored that upstream suppliers sometimes refused provide details of the content of specific raw materials, but accepted that an independent laboratory checked that it met the eco-labelling criteria.

Concluding remarks: Clearly, the information flow is easier in product chains where the end-products are usually eco-labelled. The requirements become more structured and consistent and are accepted or at least understood by the members of the supply chain.

4.6 Indirect effects on retailers

In the two studies by Heiskanen et al. (1998) and Heidenmark, Jönsson, Lindhqvist and Thidell (2001), representatives from Swedish and Nordic grocery product retail trade reported on their use of eco-labels. A few retail chains requested eco-labelled products from their suppliers and actively introduced these products in selected sections of their assortments. Among

the reasons for requesting labelled products, the most important was the environmental quality-checks the eco-labels were perceived to make. Since the retailers requested products safe for the consumers, eco-labelling served as an alternative to the retailers' internal control of product safety. They did not face any significant consumer demands for labelled products at that time.

Interviewees from retail chains actively promoting eco-labelling claimed that they could notice visible effects on environmental awareness and their internal environmental management, for instance waste management (Heidenmark, Jönsson, Lindhqvist and Thidell 2001). The attention on eco-labels appeared to be a good tool for internal environmental communication. Moreover, the eco-label efforts were found to be beneficial for the environmental image of the retail stores. The grocery retailers on the other hand who were less interested in eco-labels did not see any influences on the assortment except for household detergents.

In recent years, the Swan scheme has introduced criteria for supermarket grocery stores as a product group. Currently (August 2009) there are 386 licensed shops in Sweden and 45 in Norway. This can be interpreted as the indirect beneficial effects have been internalised into direct effects by the Swan scheme.

The study by Heiskanen et al. (1998) examined, besides the information flow regarding cleaning agents and detergents in grocery chains, the environmental information flow and the use of eco-labels in retail trade for furniture, PCs, and children's clothing. These product segments were traded by retailers, who did not actively use or promote the eco-labels. In fact, they hardly knew the eco-labels at all, or did not view them as being relevant for their businesses.

Concluding remarks: Most actors of the retail trade do not use eco-labelling indirectly for any benefits of their own. Some Swedish grocery retail chains form, however, an exception by using the labels as product checks in order to avoid performing their own environmental product evaluations. This contributed to a better over-all image. On shop-floor level, the attention to eco-labels improved internal environmental awareness and management.

4.7 Synergies between/among eco-labelling schemes

Various kinds of co-operation and harmonisation between/among different Type I eco-labels is supported by GEN in their GENICES process, which was initiated in 2003 (GEN n.a.). The EVER study reported that criteria documents of the EU Eco-label were used by other schemes, for instance the Austrian (EVER 2005).[5]

The synergistic effects between the Swan and the EU Eco-label were emphasised in the assessment of the Nordic scheme in 2007/08 and reported in Aalto, Heiskanen, Leire and Thidell (2008). It pointed out that synergistic effects can be effectual from different levels of collaboration. Synergies between the Swan and the EU Eco-label can be gained through three main routes: harmonisation of criteria, adoption of each other's existing criteria, and phasing out the Swan's criteria. The routes for individual product groups were selected on a case-by-case basis. Conditions for the applicability were different in the decision-making processes in the two schemes, which could hinder the synergies, for instance, when criteria documents should be revised.

Besides conventional synergies, when influencing similar product groups, the competition between the Swan and the GEC schemes in Sweden has been found to be a major reason for the relative success of eco-labelling in the country (EVER 2004).

Concluding remarks: The actual synergies between different Type I schemes is a relatively recent phenomenon. The schemes can influence each other by sharing information, use each other's criteria and benefit from joint marketing.

4.8 Synergies between/among eco-labels and other information systems

In recent years and in parallel with an increasing consumer interest in social, ethical and health aspects, it has been suggested among policy-makers and

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[5] As a marginal note, it is of value to underscore that when the Nordic criteria development was initiated in 1989, the intention was to translate and use the German Blue Angel criteria. This approach was however, abandoned due to different national conditions and product characteristics (Backman, Lindhqvist and Thidell 1995a, Appendices 5 and 6).

others to include such additional requirements in the eco-labelling criteria instead of promoting new schemes. However, both EVER (2004) and Aalto, Heiskanen, Leire and Thidell (2008) found weak support for that kind of combinations among the stakeholders.

An alternative approach has been joint consumer information campaigns between the Swan, organic food labelling and the social label Fair trade (Aalto, Heiskanen, Leire and Thidell 2008). This kind of joint information provision increases the mutual knowledge about each other's information schemes and may help to reduce consumer confusion, which was one of the original objectives when the Swan was introduced as the official Nordic eco-label.

Moreover, it was demonstrated that Nordic consumers use complementary labels; the Swan, the organic labels, GEC in Sweden, in their everyday purchase decisions. The main labels are well known by Nordic consumers (Paper I) and the huge number of other labels appeared to be overlooked. Thus, the confusion issue appears to be exaggerated.

The stakeholder interviews conducted by Aalto, Heiskanen, Leire and Thidell (2008) revealed that social, ethical and health aspects were included in the Swan's criteria when that was relevant and possible. This is illustrated by the Swan's use requirements for organic production in the textile criteria and the sustainable forestry requirements according to Forest Stewardship Council (FSC) for paper products and wood furniture. This is also true for the energy labels, the Energy Star and the mandatory EU energy declaration, for various appliances.

Potential synergies between/among eco-labels (Type I), self-declared claims (Type II) and certified environmental product declarations (Type III) have been repeatedly highlighted in the literature. Evidence and indications of such synergies have been sought in several studies, for instance, Heidenmark, Jönsson, Lindhqvist and Thidell (2001), Edlund, Leire and Thidell (2002), and Aalto, Heiskanen, Leire and Thidell (2008). So far, the indications of real synergies between/among these different kinds of information systems are weak. Rather, the thorough examination of synergies by Edlund, Leire and Thidell (2002) identified a number of barriers, such as different types of data, principles and practices, besides the predominantly different scope, when it comes to the covered product groups. The real synergies, as stated by eco-labelling criteria developers,

were found in the opportunity to use the LCAs that serve as background to the EPDs rather than using the EPD as such.

In 1996, the Swedish IT and Telecom Industries (SITO) launched a common format for environmental product declarations for computers, printers, and fax and copy machines. When it was designed, certain requirements and aspects from the Swan and Blue Angel eco-labelling schemes were included (Heiskanen et al. 1998).

Another environmental product declaration, the Paper Profile for paper products, was partly introduced as a reaction to the Swan (Edlund, Leire and Thidell 2002). Interviewed industry representatives from the sector claimed that eco-labelling was unsuitable as a communication tool in relation to their needs. The number of licences issued for paper products has gone down from 74 in 1994 to 21 in 2009.

Concluding remarks: There are obvious synergistic or indirect effects between/among different Type I eco-labels and influences on the Swan from social, organic/production and energy labelling. The eco-labels have also influenced environmental product declarations of different kinds. However, the synergies between the Swan scheme and Type III EPDs appear to be weak or absent.

4.9 Synergies with other policy instruments

Various connections between eco-labelling and other policy instruments have been discussed and regarded in literature, in practice and as suggestions in the debate on developments of other policy interventions. The most obvious relation is the primary fact that eco-labelling criteria exceed those specified by legal standards. Hence, all applicable policies and instruments that influence eco-labelling are relevant. In the case of the Nordic Swan, it was emphasised from the beginning that its criteria must exceed or be equal to the legal standards in any of the Nordic countries.

The other way around, the understanding of how eco-labelling can cause effects on other policy instruments by its effects or in synergetic interactions, is still largely in an emerging stage. Cadman and Dolley (2004) suggested inclusion of EU Ecolabel requirements in the EuP directive, as standard in the 'New approach', or as denominator for VAT reduction on 'eco-friendly' products.

Products, which have been awarded the EU Eco-label will be considered as compliant with the implementing measures of the EuP directive, if the Eco-label meets the requirements of the implementing measures (EU DG Enterprise and Industry n.a.).

In Paper V, it was reported how eco-labelling has influenced green public procurement (GPP) in Sweden. Both the Swan and the GEC were considered when GPP was initiated in the first years of the 1990s in Norway and Sweden. However, when the purchasers could rarely request eco-labelled products, the eco-labelling schemes influenced the green purchasing indirectly in other ways, such as providing inputs to green procurement manuals, as market indicators and as validation of claims. In recent years, there is a mutual information exchange between the Swan scheme and the Swedish Environmental Management Council (SEMCo), the body currently developing green procurement requirements for the public sector in Sweden. A similar situation occurred in Norway, where the GRIP centre had the function of promoting green public procurement (See Paper V).

Despite the intention of guiding (private) consumers, the Swan, from the beginning especially addressed professional purchasers by considering product groups, such as fine and printing paper, office appliances, printed matter, and tone cartridges, mainly aimed at the professional market. Currently, the Swan has a range of product groups aimed at the business-to-business market and the scheme actively promotes the use of the label among professional purchasers (Aalto, Heiskanen, Leire and Thidell 2008). This is another example of the scheme's internalisation of indirect effects into direct effects.

Concluding remarks: Various synergistic indirect effects from eco-labelling on other policy instruments have been suggested. A few of them have been tested and examined empirically. GPP is the most prominent application in which eco-labelling schemes have served multiple functions, which were outlined in Section 4.3.

4.10 Negative effects

It should be acknowledged that exploration and explanation of indirect effects primarily leads to beneficial ones. However, the review of effects clearly shows that the picture is not unambiguous. Similar actors view and make use of eco-labelling in different ways, which supports the notion of

parallel intervention theories. Nevertheless, this thesis author argues that a voluntary scheme, such as eco-labelling, sorts out most of the negative effects because those who do not perceive any benefits simply reject the use of the Swan. Yet, the negative side of eco-labelling has not been fully investigated.

Nevertheless, the conducted interviews exposed some negative comments and a few negative effects. Some of them, such as costs, resource use, bureaucracy, etc. from non-licence holders, could be set aside as these arguments primarily indicate that the market attraction of the label is perceived to be weaker than the potential gains from using it. This kind of trade-off is obvious and is a given component of a voluntary policy instrument.

Some licence holders mentioned a perceived lack of transparency, perceptions of difficulties to influence the process and uncertainties of the relevance of the criteria that were selected for certain product groups. These comments of scepticism can be based on experiences, but can also be related to a lack of information. There are licence holders who cannot see any synergistic effects and in mere frustration of demanded environmental information, in general, complain about the bureaucracy or details in the criteria. These licence holders deliver the information, but are apparently not pleased to do so. These aspects are associated to the legitimacy of the scheme.

Another aspect with regard to Swan's legitimacy is when licence holders perceive that the sharpening of environmental requirements in a product group's criteria has come to an end, meaning that further improvements are so incremental that the relevance of eco-labelling in that product group is limited. This has happened, for instance, in the household detergents and cleaning agent product groups.

Concluding remarks: The negative effects of the Swan in relation to environmental issues have only been minimally studied. However, one would expect that the negative impacts are relatively small due to the voluntary nature of eco-labelling. The thus far detected negatives are primarily related to legitimacy aspects.

4.11 Summary of indirect effects

The study by Heidenmark, Jönsson, Lindhqvist and Thidell (2001) concludes that there are several positive indirect effects from the Nordic Swan scheme, for instance, on non-labelled products and EMS. The presence and extent vary between companies and Nordic countries.

The indirect effects have been systematised in different ways: from actors' perspective (Heidenmark, Jönsson, Lindhqvist and Thidell 2001), according to influences on certain functions (Leire and Thidell 2005a), or expected types of effects (Cadman and Dolley 2004). In this thesis, the effects are structured according to stakeholder/actor-influenced by/causing the effect, and under that, the different kinds of effects.

The Swan has a high level of credibility and through its presence contributes to increased environmental awareness, used in public and private professional purchasing, and environmental communication.

In Chapter 3, it was concluded that even direct effects were difficult to attribute to the eco-label per se. The cause-effect relations of indirect effects are, for obvious reasons, even more troublesome to attribute to the eco-label (See Paper IV).

From a methodological perspective, one should ask what constitutes empirical evidence of indirect effects. Most information on indirect effects was collected as qualitative evidence from personal interviews with practitioners. The knowledge base is built from the individual interviewees' experiences and impressions, as well as personal judgment, perceptions of the eco-label in the first place. Thus, it can be difficult to prove that the indirect effects can be generalised.

People with a positive attitude towards the Swan find more positive synergistic effects than those with a negative attitude, which is not surprising. However, similar answers from several respondents can serve as background for more solid conclusions on real indirect effects. Most information is anecdotal and of qualitative nature presented as stories and examples (epistemology). Yet, there are no commonly applied methods that are designed to quantify their relative importance. The indirect effects go far beyond the criteria and product groups that limit the extent of the direct effects. Thus, the indirect effects are most likely more important than the direct effects.

CHAPTER
FIVE

5. Analysis and discussion

5.1 Effects of the Swan

From the previous chapters, it was clear that the Nordic Swan eco-labelling scheme causes effects of both direct and indirect kinds. The **direct effects** can be defined as environmental benefits, as well as other effects and changes leading to environmental benefits, from changes of licence holders' products in a life cycle perspective conducted to meet present and revised environmental criteria, and, subsequently, from consumers' purchases of eco-labelled products.

The direct effects from the Swan and other schemes depend on:

- **The eco-label** in its market attraction for selling the particular products. This aspect is primarily based upon consumers' willingness to use the eco-label as guidance in purchase decisions, but is also the attractiveness for producers as a vehicle to channel their environmental communications through the eco-labels rather than using other means of reaching their concerned consumers;
- **The scheme** and it's credibility and ability to deliver accepted criteria for relevant product groups. The credibility and trustworthiness influence both consumers in their perceptions of the eco-label and the eco-labelled product, as well as, producers' willingness to consider the scheme and to use its criteria;
- **Individual product groups** and their criteria, acceptance of the criteria among producers, and caused dynamics. It provides the means by which the eco-labelling scheme directly influences producers' environmentally sound product development and, thereby, causes environmental benefits, which are limited to the individual product groups with established criteria and the producers of such products;

- **Dynamics of change/institutionalisation of knowledge and behaviour** through eco-labelling can influence the dynamics of consumers' environmental purchase behaviours, the producers' readiness to adapt the criteria, and the eco-labelling scheme's ability to upgrade its criteria through continuous revisions. When a number of licence holders with significant market shares stay with the scheme, it can be concluded that it is causing dynamic on-going product developments.

The **indirect effects** are the effects and changes that can be fully or partly related to the presence of eco-labels, eco-labelled products, operations of an eco-labelling scheme or its criteria, but not to the direct effects of them. The indirect effects are, in particular, influencing consumption, production, information, and/or policy measures in an environmentally preferable direction.

The concept of indirect effects has gradually emerged. From the examples researched for this thesis, it is possible to conclude that indirect effects exist, but it is not possible to exclusively attribute them to eco-labelling. In addition, it can be concluded that the indirect effects are not necessarily obvious. They have to be looked for since the indirect influences and usage of eco-labelling related information appears to be based upon personal interests or benefits for his/her organisation. It was further concluded that the described indirect effects have influence far beyond the established goals of eco-labelling, while contributing to the over-arching vision of sustainable consumption and production. Based on the studies, it is reasonable to conclude that the indirect effects make significant contributions to the over-all effectiveness of an eco-labelling scheme.

Despite the actual and potential direct and indirect effects of eco-labelling, the expectations on eco-labelling as a policy instrument must be reasonable and realistic. The inherent limitations of eco-labelling causing direct benefits were highlighted in Section 3.5. The indirect effects were found to be difficult to isolate from other influencing factors.

This thesis author does not believe eco-labelling is the 'great' or 'magic' policy instrument that can solve or even address all possible environmental issues of the society. In contrast to some more optimistic authors, for instance Rubik, Scheer and Iraldo (2008), who stated, "eco-labelling plays a key role within environmental policy making". In this thesis author's

perspective, eco-labelling plays important roles, but it is not and cannot become the key policy instrument.

One can understand the enthusiasm of some proponents since eco-labelling is visible, successful in some cases, and not least, it is one of very few instruments that clearly addresses the product issues and clearly points out what constitutes environmentally preferable products. Eco-labelling schemes have some interesting features and, they also have further potentials. However, the limitations linked to the fact that they are voluntary and market-oriented instruments must be remembered. It is reasonable and productive to view eco-labelling in the larger policy context when considering what combination of instruments should be used for certain issues. These issues could, for instance, be sorted into the following categories:

- Actors addressed: consumers, producers, product policies, etc.;
- Environmental problems: climate, toxic substances, waste, water and carbon footprints, etc.;
- Informational roles: Awareness raising, education and training, stimulation of research and development, etc.

5.2 Generalisation of effects of eco-labelling?

The accounts of direct and indirect effects provided in Chapters 3 and 4 are predominantly related to the Nordic Swan scheme. Despite the fact that similar relevant effects have been highlighted or suggested from other eco-labelling schemes, it is obvious that the outcomes vary substantially between schemes. The most evident differences are related to market impacts in terms of number of licence holding producers, the diversity of labelled products on the market and the degree of consumer recognition. A highly relevant question is whether the findings from the Nordic Swan are generalisable for eco-labelling in general.

Fundamentally, most eco-labelling schemes are organised and work in similar ways, although there are differences in work procedures, information budgets and strategies. Therefore, this thesis author argues that the potential to realise such effects could be general, but the various intermediary and final outcomes experienced today are largely related to factors other than the concept of eco-labelling, as such. Such a discussion however, goes beyond the scope of the thesis, but it appears that the context of the policy

intervention, in this case the introduction of an eco-labelling scheme, is an important subject for further examination, including vertically and horizontally packaged policies that may complement each other. Furthermore, the individual actors' awareness of and ability to utilise different elements of eco-labelling for other purposes are valid reasons for studying the beneficial, indirect effects more deeply.

5.3 Measurement methods

In this thesis, a number of direct and indirect effects of the Swan have been demonstrated. The knowledge on presence/absence, nature and magnitude/ significance of these effects is dependent upon the methods applied for the detection, description and evaluation of them.

5.3.1 Consumer awareness and knowledge

Consumer awareness and knowledge are mainly measured through well-established consumer research methods, such as surveys, questionnaires and focus groups. Mostly, these measures focus upon 'know of' attributes of the policy instrument (in this case the eco-labels). Changes in consumer awareness regarding environmental consequences of consumption and opportunities for action are rarely included in these studies. However, the measures are commonly used as proxies and regard, in most cases, eco-labelling in general or specific eco-labelling schemes.

The methods deliver quantitative information that can be used for further analysis of consumer segmentation in order to describe the types or market segments of consumers that actually use environmental information.

5.3.2 Consumer behaviour changes

Consumer behaviour changes are rarely measured or reported in the literature but they are an important parameter. The reason for the limited amount of studies is probably related to the extensive need for empirical data that must be collected over a period of time, in order to perform a sound assessment. Bjørner et al. (2002a; 2002b) showed that it is possible to successfully perform such studies and to clarify issues related to changed consumption patters derived from the Swan for the examined product groups: toilet paper, paper towels and detergents. Still, this only provides limited information on general changes in consumer behaviour due to

environmental preferences. Longitudinal studies, based on long-term, consumer panels and similar methods, have the potential to generate more systematic findings on changes in consumption patterns over time. However, this should be further researched and tested in practice.

5.3.3 Market share changes

Market share changes for eco-labelled products are used as proxies both for consumer behaviour changes, producer changes and market attractiveness of the eco-label. Changes in market shares of eco-labelled products can sometimes be derived from the retail trade from cash register or sales statistics. The conditions for data availability vary considerably among different product groups, since major retailers are not equally willing to share sales statistics, or when the sales statistics is spread on many actors due to fragmented market structures. Moreover, market share statistics for eco-labelled products do not necessarily represent changes in demand for environmentally improved products. It can simply be a matter of producers on a stable market that decide to apply for a licence without making any product modifications. An alternative approach is to use a producer's sales statistics for certain products before and after it has been/they have been eco-labelled, when they accept to make such information publicly available.

5.3.4 Producer behaviour changes

Producer behaviour changes include a number of activities, such as product re-design, increased environmental awareness, new design practices, environmental management, enhanced environmental communication in the product chains and so forth. Obviously, this implies access to quantitative and qualitative information spread throughout several departments and persons within the same organisation. These effects are not defined or expressed in commonly accepted concepts or indicators. Instead, a method that makes use of qualitative semi-structured interviews is a common means for descriptive information collection. The findings are, to some extent, dependent upon the researcher's design of the questionnaires, his or her skill in conducting the interviews, his or her understanding and interpretations of the results. Some aspects of changed producer behaviour, such as product re-design, and process modifications, have been investigated in conventional surveys.

5.3.5 Environmental benefits

Direct measurements of environmental benefits are mostly ignored in evaluations; this stance is justified by insufficient methods and/or by inadequate datasets. An empirical method for reasonable quantifications of emission reductions has, however, been demonstrated for specific product groups (Wilske 1999). A possible approach for the application and further development of that method was proposed in Paper II for the quantification of environmental benefits for individual product groups. It requires estimations or actual market share figures as well as accurate data collection from the producers and professional insights into the processes and products of the sector in the way described in Section 5.3.4.

Besides that, different methods of more theoretical estimations based on assumptions have been suggested. It appears that the most fruitful approach to assessments of changes in environmental benefits is to address them, one-by-one, for each product group.

5.3.6 Indirect effects

Indirect effects can, like the direct producer-related effects, be of both qualitative and quantitative nature. However, the indirect effects are mainly detected as experiences or perceptions the interviewees provided in qualitative interviews. Sometimes the indirect effects become evident, for instance, as contributions to EMSs and green procurement instructions.

There is an obvious need for method development in order to address such indirect effects. But it is also necessary to consider the measurability of these effects, that is, the extent to which an outcome is detectable and possible to attribute to the eco-labelling. It seems clear that most of the indirect effects cannot be measured in traditional ways since the concepts are still vaguely defined and the effects appear to be very much person-related. However, it is reasonable to assume that qualitative information can be derived from the interviews. The first attempts for method development are probably found in structured and common ways of expressing identified indirect effects.

5.3.7 Concluding remarks

This review of methods employed to detect and measure the various effects clearly shows that there is, with a few exceptions, a significant scarcity of established parameters that can be used to quantify the magnitude of the

impacts of the eco-label. This is also the probable reason for the widespread usage of various proxies. This thesis author provided argumentation for proxy-based methods in Paper II, suggesting a simplified approach for quick-evaluations of eco-labelling schemes. This method is outlined in Table 5-1. The proxies address: (a) the range of eco-labelled products, (b) the market attraction of the scheme, (c) conditions for making an impact, (d) potentials for causing an impact, (e) direction and trends of the scheme, and (f) potential to deliver environmental benefits.

Table 5-1. Proposed framework and proxy indicators for evaluation of direct effects of eco-labelling schemes (Paper II)

Proxy	Indication of:
Number of product group criteria developed.	Range of labelled products and opportunities for dissemination of information on environmentally benign products.
Number of product group without issued licences.	Market attraction (lack of perceived corporate benefits from adopting to the eco-label), unrealistic level of requirements, weak capacity to identify relevant product groups.
Number of product groups with licences, the total number of licences issued.	Market attraction. Ability to respond to or to induce market needs.
Consumer recognition and knowledge about the eco-label, confidence in the eco-labelling scheme.	Conditions for impact, trust and credibility.
Measured or estimated (insignificant, modest, medium, significant) market shares.	Potential to cause impacts.
Trends in the foregoing indicators.	Direction of the scheme's attractiveness.
Judgement of product group relevance and criteria requirement levels based on stakeholder consultation and coverage of the eco-labelling scheme in the media debate or from desktop assessment.	Potential to deliver environmental benefits. Trust and credibility in the scheme.

Other effects, such as certain aspects of consumer behaviour changes, market shares of eco-labelled products and environmental benefits, are possible to measure, but such measurements are resource and knowledge-demanding tasks; furthermore it could be questioned whether such studies are reasonable.

The implications of the above-mentioned dimensions are that evaluators should accept the applicability and possible benefits of using different proxies for a number of effects. Many of the most important effects, such as producers' changes of products and production processes, are difficult to measure in any other manner. Quantified data or detailed knowledge of such effects can probably be measurable through resource-intensive methods but the value of quantified data should be related to the resource use for the accomplishment.

5.4 Relation to evaluation criteria

This section analyses the findings of this thesis researcher in relation to the selected evaluation criteria. The use of evaluation criteria is traditionally connected to evaluations and what the evaluator wants to examine. In this thesis, the evaluation criteria are used for the examination of the nature of the effects and their relation to the eco-label. The examination of criteria credibility and trustworthiness contributes to the understanding of the actors' views and perceptions of the Swan and the reasons for them to indirectly gain benefits from it.

5.4.1 Effectiveness

Effectiveness is the degree of goal realisation that is due to the use of a certain policy instrument (Bemelmans-Videc 1998, p. 7). An effectiveness evaluation should include both direct effects and side-effects of the instrument, positive, as well as, negative. Mickwitz (2003) describes effectiveness in terms of goal achievements as to what degree the achieved outcomes correspond to the intended goals of the policy instrument. But he also adds that effectiveness in reaching other public goals can also be assessed given that they are first identified (Mickwitz 2003, p. 426).

The effectiveness of the Nordic Swan is therefore, an analysis of the goal achievement of the identified and described direct and indirect effects that can be reasonably attributed to the scheme (the intervention). Attributability

is a matter of the extent to which the outcomes can be attributed to the intervention (Vedung 1997, pp. 37-39). The degree of certainty of attributability can be related to the level of autonomy of the influences of the intervention (Duignan 2004).

It is clear from Paper I that consumers know and trust the Swan while the multitude of other labels are largely neglected, which addresses the Swan's goal of consumer guidance. The scheme has contributed to a decrease in the confusion from the wide diversity of different environmental attributes and claims that some producers may want consumers to associate to their products. Regarding direct effects, it is evident that the Swan is used by a segment of consumers and that there are producers who adapt to their products so that they fulfil the criteria requirements.

Since the environmental requirements, in criteria documents for the various product groups, are commonly accepted by stakeholders as being relevant and sufficiently strict, it can be stated that the Swan helps to drive product development towards better environmental performance. Thus, it was concluded that the goals of stimulating an environmentally sound product development through the usage of market forces were met. However, it has not been possible to measure the outcomes in sound quantitative ways.

The analysis of indirect effects shows that the Swan, influences and causes intermediary and final outcomes besides the direct effects. The occurrence of indirect effects is highly dependent on how individual actors utilise information, build relations, manage other intermediary outcomes, etc. Thus, their ways of working are not as clear and predictable as what concerns the direct effects. In various applications of environmental management and through being used in consumer information material and in campaigning, the indirect effects contribute to sustainable consumption and production, which is the ultimate vision of the Nordic Swan scheme.

Attributability

The attributability of effects from eco-labelling is, in general, difficult to verify due to the multitude of influential factors on the actors. The degree of autonomy of the intervention is limited. Besides measured data on market shares and consumer knowledge, most effects are detected and reported as personal experiences of the interviewed actor representatives. In most cases, the observed effects are clearly, but not exclusively, linked to the eco-labelling scheme. However, in some cases, the attributability is more diffuse.

In the view of this thesis author, an isolated effectiveness evaluation of the Swan scheme does not provide a sufficiently full and clear picture since the attributability aspect is difficult to handle properly. Instead of searching for effect allocations as such, it seems that it would be more fruitful to regard the achieved effects to be due to synergies between/among several interventions (both policy interventions and others) and therefore, it is important to identify combinations that reinforce each other.

5.4.2 Efficiency

Efficiency refers to the input-output/outcome ratio of the policy instrument (Bemelmans-Videc 1998, p. 7), which normally is interpreted as ratio of the benefits to the costs. Mickwitz (2003) divides efficiency into two categories in relation to the outcomes. The first is traditional cost-benefit analysis, when both benefits and costs are expressed in monetary terms. The second is to determine if the cost-effectiveness of the gained results justify the resources used. There, the benefits are not valued in monetary terms (p. 427). The latter approach could be used for a discussion whether the same benefits could be achieved with fewer resources.

The efficiency in relation to direct effects was discussed in Paper II. It concluded that efforts to place monetary values on achieved benefits have so far been less productive due to inadequate quantitative data. Instead the researcher took a cost-effectiveness approach and discussed the cost issue in relation to whose costs should be considered. Since the request for and interests in the evaluations of policy instruments are mainly by the initiators, this thesis author concluded that the costs should be allocated to the governmental contributions to the Swan scheme; he found these contributions to be small in relation to the direct effects, only. Adding the indirect effects on top of the direct effects strengthens the conclusion of reasonable benefits for the investment. However, this efficiency analysis only considers the Swan scheme and does not include other supporting and synergistic interventions.

5.4.3 Credibility-related criteria

Credibility and trustworthiness are essential components of a well-working eco-labelling scheme. The evaluation criteria of legality and democracy, legitimacy and relevance were all selected since all of them provide important contributions to these aspects of the Swan. When the analyses

based upon these criteria are documented to be positive, it is, in the view of this thesis author, more likely that the observed effects can be attributed to the intervention.

The legality and democracy criteria are, according to Bemelmans-Videc (1998, pp. 7-8), referring to if the design and implementation of an intervention corresponds to accepted norms and democratic public order as well as if the implementation process follows the principles of proper administrative order.

In the case of the Nordic Swan, it was introduced as a means for meeting an increasing supply of and public demand for accurate environmental information on products, which can be viewed as an increased willingness to steer the development by personal actions. The process of public investigations before the launch of an official Nordic eco-labelling scheme is outlined in detail in Backman, Lindhqvist and Thidell (1995a) It was found to follow the practice in all Nordic countries and the implementation has not been questioned to any noticeable degree. Later interventions by Nordic policy-makers and modifications of the decision-making structures of the scheme have followed the consensus principle prevalent in all Nordic co-operations.

Legitimacy is a separate concept and it is related to how just and lawful the intervention instrument is perceived to be by the involved actors, in the framework of their actual support. Thus, it corresponds with the actors' own views, feelings and objectives. Legitimacy represents a political criterion which stresses that acceptance is crucial for the actual effectiveness of a policy or programme (Bemelmans-Videc 1998, p. 8).

When examining the Swan scheme, this criterion can be viewed in two ways: from the scheme's perspective, and from the individual users' perspective. From the side of the scheme, legitimacy it is crucial and highly related to confidence and trustworthiness, which is the core of any successful scheme. The early criteria development processes were characterised by this issue and evolved gradually (Backman, Lindhqvist and Thidell 1995a). In the current situation, when the Swan is well established on the market and thousands of products are labelled, the scheme has built the reputation of being fair and legitimate. From the perspective of individual users, the legitimacy aspect is less problematic since the scheme is voluntary. Those who dislike it simply neglect it was elaborated on in more detail in Section 4.10.

The relevance criterion is, according to Mickwitz (2003), related to if the goals of the environmental policy instrument address and influence key environmental issues. In the case of eco-labelling, the evaluation criterion can be used to question specific norms or rules of the Nordic scheme's ability to handle conflicting goals of different stakeholders.

In the case of the Swan scheme, the relevance criterion is closely related to the environmental demands each producer applying for an eco-labelling licence must meet. Thus, the key to the relevance criterion is primarily to be found in the chosen environmental aspects and specific requirements of the scheme's environmental criteria, including the data background used for their development, as well as the development processes leading up to decisions on their final content. A secondary relevance aspect may be the environmental significance of the various product groups the scheme has established criteria documents for.

In Paper II, this thesis author demonstrated that the criteria of the Swan are commonly accepted by the actors and that the process leading up to them builds on consensus-making trade-offs. Eco-labelling is a unique instrument in the feature of identifying and reaching agreements on high requirements for product-related environmental performance.

The number of product groups within which producers can have their products awarded the Swan label clearly show that potential conflicts in positions, norms and rules have been taken care of in that process. From the situation with apparent friction in the early days of criteria development (Backman, Lindhqvist and Thidell 1995a), the process has evolved effectively. Only in a very a few cases, such as in the revision of criteria for windows and printed matter, have similar issues caused problems (Aalto, Heiskanen, Leire and Thidell 2008, Chapter 6).

5.5 Approaches for synergistic and indirect effects

One aspect of the indirect or side-effects is that they cannot be taken for granted or be evaluated as intended effects in the target area. Rather, they are viewed as 'anticipated or unanticipated' effects, implying the need of explorative or heuristic approaches and methods, or analysis of other studies somehow touching eco-labelling.

This thesis author took part in three such projects. The first of them investigated environmental information flows and communication in four distinct product chains in Sweden. The product groups of all four chains could be labelled with the Swan (Heiskanen et al. 1998). The second study was the second evaluation of environmental effects of the Nordic scheme, including direct and indirect effects (Heidenmark, Jönsson, Lindhqvist and Thidell 2001). The third study had the objective of investigating conditions under which the Swan and other information systems could be interconnected. The approach included Type III declarations, EMS and the use of key environmental performance indicators (Edlund, Leire and Thidell 2002).

These empirical studies were built on investigations of expected information flows. In the first study, actual product chains and the flow of products and information were examined. In the third study, licence-holding producers were used as the starting points. Their potential information flows and uses were mapped (Figure 5-1) and were analysed based upon the information derived from interviews with the actors. Another approach is to structure information flows and potential secondary uses of eco-labelling from rational thinking. A common feature of the two approaches was to obtain insight into the relations between/among actors that can be further studied through various methods.

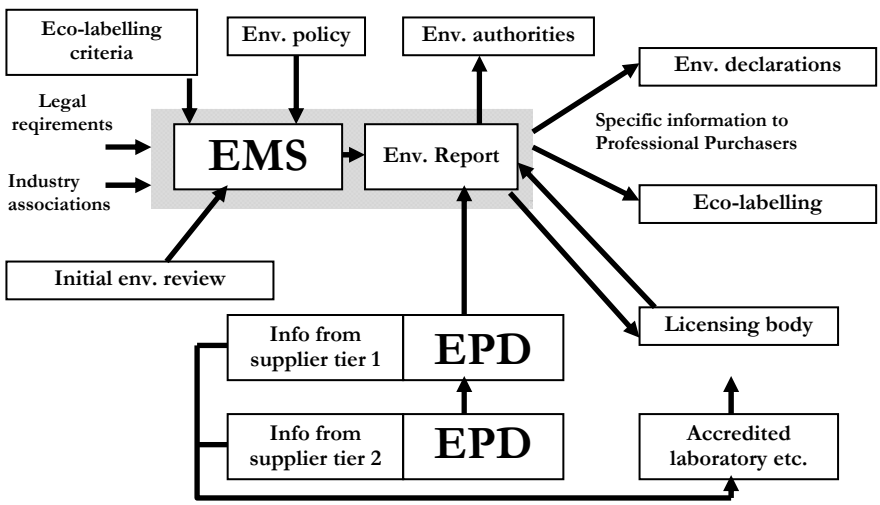

Figure 5-1. Potential information flows around a licence holding producer (from Edlund, Leire and Thidell (2002))

A third approach, which was used in the research of Edlund, Leire and Thidell (2002), was built upon analyses of potential synergies between/among different environmental information systems including EMS. A matrix with selected commonly used systems was constructed and potential synergies were tested from the literature and from knowledge about the systems. In that case, relations between/among eco-labelling, EPD declarations Type III, self-declared claims Type II, self-declared environmental declarations, energy labelling, EMS, voluntary environmental reports/green accounting, and compulsory reports to the environmental authorities were studied. Potential synergies were then explored with practitioners in industry, representatives from various information schemes, and other experts in agencies and industry organisations.

Thus, the search for indirect effects is of an explorative or heuristic character, but can be guided based upon ideas of where or in what relations they are likely to occur. The absence or presence of indirect effects in one such point does not necessarily result in a similar observation in another combination of interactions. Unanticipated indirect effects appear to be discovered by sensitive reading of reports and by addressing neighbouring areas of research. However, this method should not be considered to be satisfactorily robust; therefore, it is anticipated that more indirect effects may be discovered based upon further methodological refinements.

Repeatedly, there are theoretical analyses of environmental information flows ending up with suggestions on integrated and holistic systems for instance, Rubik and Frankl (2005, Section 8.6). The conditions for information systems integration was also a starting point for the examination of synergies in Edlund, Leire and Thidell (2002). Such a system would be provided with input data from LCA studies, EMS, environmental permitting and best available techniques (BAT). The outputs should be EPDs (Type III), eco-labels (Type I), Key Environmental Performance Indicators (KEPIs), environmental reporting, legal compliance, green procurement requirements, etc. A holistic system should contain all information all actors need for their purposes, in a uniform format, and verified to the level to satisfy the most demanding actor.

This thesis author's conclusion is that making the information system the starting point for such a development may be less productive than starting from the actors' need for the information. When tailor-made for actor's needs and uses of information can, on the other hand, lead to the

development of different kinds of schemes, which may have disadvantages in terms of finding synergies, but may have better chances of being useful.

5.6 Trends and developments in eco-labelling

5.6.1 Sustainability labelling

The idea of attracting concerned consumers' attention and guide their purchases to products with certain attributes through a label or logo in a similar way as eco-labels has gained interest in recent years. Besides the different labels with environmental connotations mentioned in Section 2.2, are also social labels addressing consumers on the market. There are some people who ask for one label to address all sustainability aspects, such as ethical, social, organic production, health, and climate, in order to reduce potential consumer confusion and to build upon synergies between or among schemes. The possibilities for including various new aspects in the Swan-labelling were addressed in (Aalto, Heiskanen, Leire and Thidell 2008, Chapters 7-8).

The idea of including aspects other than strictly environmental ones within the eco-labelling criteria is not new. Product quality aspects and occupational health and safety issues were included in the criteria of the Swan scheme from the beginning. Additionally, other health issues are certainly addressed in the criteria for some product groups through restrictions of hazardous substances. It seems clear, especially from the marketing of the Swan in Denmark, that health reasons are valid arguments for consumers to purchase Swan labelled products.

Separate climate labelling and information, which was mentioned in Section 2.2.5, gained considerable attention in recent years. In the case of the Nordic Swan, energy and climate-related issues have been dealt with in relevant product group criteria, although there is a need to systematise the aspects in the product group criteria (Aalto, Heiskanen, Leire and Thidell 2008, pp. 100-106). It was thus concluded that the eco-label also served as a climate label for the product groups covered by the scheme, but can not fulfil that function for other product groups subject to climate labelling, in particular food products. Other issues, such as raw material production (organic, sustainable forestry, etc.), were found to be included in a pragmatic manner when relevant for a specific product group. The officers of the eco-labelling scheme know of and utilise the criteria and requirements of other schemes

in the Swan's criteria development process. Consequently, it was concluded that there are synergies between the schemes.

It is easy to understand the arguments for development towards one product-labelling scheme integrating more or all sustainability aspects but there are a few limitations. Product groups suitable for labelling one aspect may not be suitable for another and it may be difficult to communicate for which product groups environmental aspects are important for the label and when, for instance, social issues are predominant. For example, some footballs are labelled with the social label 'Fair Trade' but it is difficult to verify that these footballs also comply with the eco-labelling criteria for textiles and leather.

The markets for different product groups have different foci; social issues may be more dominant in some and environmental issues in others, which may simply lead to redundant consumer information and unnecessary requirements for the producers, which may result in fewer labelled products.

It should also be noted that some of the information schemes have different purposes: pointing out the superior products in the case of eco-labelling, pointing out acceptable products in the case of Fair Trade, and pointing out a specific production concept in the case of organic labelling.

Thus, Aalto, Heiskanen, Leire and Thidell (2008) found that a full integration of sustainability issues in the Swan scheme might influence the consumers' perception and trust in the scheme since its objectives and goals would be less clear. In addition, there are practical problems to address in the verification processes (p. 92).

5.6.2 New product groups in services

The Swan scheme has demonstrated effective skills in working with market actors for identifying new product groups. The 'pioneer group initiative' is one such way to explore the potentials. Over the years, there has been an increasing use of eco-labelling in services; for instance, alternative laundry, shopping malls, photo developing services, print shops, etc.

Eco-labelling can apparently contribute to a more structured environmental management in these firms even if fully certified EMSs are not used by them. When used properly, it appears that environmental awareness of staff, suppliers and customers can be increased through an active uptake of eco-

labelling. Thus, services in such sectors or in small sized companies in which standardised EMSs are rarely considered to be relevant, could be targeted for further development of new product groups. One could think of public services, kindergartens, offices, schools, pubs, yacht clubs, tourist attractions and, maybe, events, as possible types of firms, which could benefit from such efforts, provided there is a market interest among them.

5.6.3 Policy packaging and new allies

In the following section, this thesis author outlines ideas on how eco-labelling schemes can actively search for synergistic effects by using combinations of new possibly relevant environmental information sources. In the first case, it is a matter of finding other schemes and policy instruments that share similar goals and identifying how they can support each other in order to improve their effectiveness in reaching the public, and stimulating sustainable consumption and production. In the two other cases, new kinds of information and advisory bodies are acting in areas not covered by eco-labelling and thus they fill a potential information demand gap.

Systematic search for synergies with other policy instruments: Various policy instruments can support each other horizontally and vertically (Vedung and van den Doelen 1998); the Swan has gained from combined marketing with other labels, consumer campaigns and with other information. Other actors, such as consumer agencies, local authorities, private companies and many others, who issue information materials on environmental implications of products and green consumerism, could also become effective allies. The eco-labels and other prominent environmental information systems are often mentioned as reliable sources of supportive information for making purchase decisions. Therefore, these tools, information schemes, policies, etc. can gain promotion advantages from each other and from the actors using them. This contextual policy environment, or policy mix, is most likely to be important for a successful eco-label; therefore this thesis author suggests that further research should be done to explore the effects of their interactions and potential synergies.

Independent organisation for testing environmental performance of products: Since far from all products are suited to be eco-labelled, the environmental performance of them is not, and will not be, known to any significant extent. A question is "Could eco-labelling schemes co-operate with independent product testing organisations to evaluate them?" Some

observers, including this thesis author, believe that there is much potential to expand the capacity for those kinds of partnerships, which could test more types of products and then communicate the findings to concerned consumers without any further connections to the eco-labels. Especially in cases where they go beyond the product groups currently subject to eco-labelling, the information on environmental aspects, work procedures, information gathering, test methods and reasonable requirements, could be shared between that organisation and the eco-labelling schemes. The rationale is that qualified reliable information publicly displayed tends to serve as a driver for environmentally sound product development by itself.

Reliable advisory body for sustainable life-styles questions: There is sometimes consumer confusion on eco-labels and more sustainable life-styles. The latter often regard climate-smart living, choices among diets, transportation and travelling, and so forth. These issues reach far beyond the eco-label's guidance to environmentally preferable purchases within a given product group. A recent study (Källenbring 2009) showed that people find it difficult to navigate among all the messages and opinions. This confusion is revealed in the discussions on climate implications of food where transport and organic production was set against each other. This situation is not unique and there seems to be both a demand and a need for that kind of advice from reliable sources among some consumer segments. It is, furthermore, not possible to provide clear-cut answers to the recurring question 'What's best?' that many people in the environmental research field receive from family, friends and people who just want to learn more so that they can make more informed decisions. Clearly, eco-labelling does not, and cannot, go as far as advising between different product groups. However, this thesis author believes that some better guidance on the overall sustainable life-style questions could be provided in combination with good examples. The eco-labels are certainly not the sole answer, but have a role to play in that kind of information dissemination.

CHAPTER
SIX

6. Conclusions and recommendations

6.1 Effects and influences

The overarching research questions for this thesis regarded the direct and indirect effects and impacts of eco-labelling and how these effects can be detected and measured. The compilation and analysis of information pertaining to direct and indirect effects demonstrates that there are positive changes in both production and consumption of goods and services that, with a reasonable certainty, can be related to positive impacts of eco-labelling. The Swan is perceived as being legitimate, it addresses relevant aspects and it strives towards goal-achievement. The attributability is stronger for some effects than for others but it is not clear-cut, which can be interpreted as a problem. This thesis author argues however, that attributability should be viewed in relation to other driving and hindering forces. Since there are always developmental and change processes in society and in industry, it is primarily a matter of directions and strengths of these processes. This in turn, is determined by the sum of all driving and hindering forces that are related to the economy and resources, technology and innovation, and social values, including norms, fashion, desires, etc.

When eco-labelling contributes to drive and/or to speed up developments in a more sustainable/environmentally benign direction, it is less important if it does that as an isolated policy instrument or if it happens through synergies with other driving forces. Thus, it appears to be more fruitful to investigate what synergies between/among eco-labelling and other policy instruments, activities and social norms are most likely to be influential and how those mechanisms act and how they can be orchestrated.

It was concluded that the direct environmental effects in terms of, for instance, reduced emissions or resource use, have very rarely been quantified, even if data are available for some product groups. The Swan scheme was evaluated to be both effective and efficient in terms of outcomes in relation to the governmental costs of the scheme. The

prerequisites for gaining positive environmental effects are relevant criteria and a reasonable market penetration of the eco-labelled products that is maintained after criteria revisions. A simplified tool for that kind of assessment was suggested in Paper II. The indirect effects were seldom described in concrete terms. So far, they have been noted and qualitatively described in their ways of acting upon specified actors.

Furthermore, there is a lack of quantified information or even quantified estimates on ultimate outcomes in terms of improvements of the state of the environmental performances of the products and services.

The reason for weak or scarcely quantified data on environmental benefits is that key effects measurements are very resource and knowledge intensive. And most qualitative parameters such as producers' behaviour expressed as product re-design and all indirect effects are (not yet) measurable at all. Thus, future evaluations of eco-labelling schemes should consider what kinds of effects should be measured and to what extent, and what characterisations of effects are sufficient their purposes.

The character of the direct environmental effects is well known and it is possible to theoretically calculate the ultimate emission reduction potentials for each product group on the basis of assumptions of product environmental characteristics and market shares. In Section 5.3.5 and Paper II, an empirical approach was suggested for estimations of actual reductions, which should be explored. However, major weaknesses are present in the measurement methods of an eco-labelling scheme's ability to cause dynamic effects and in its impacts upon the indirect effects. Thus, attention should be given to develop, easy-to-use, proxies for changes in consumer behaviour and environmental product performance as well as in improving the understanding and characterisation of the indirect effects.

6.2 Connections to theory

The proposed intervention theory proved to be useful for describing the cause-effect chains and for gaining insights into the effects (in terms of outputs, outcomes and actions) associated to the Nordic Swan. It was found to be useful for gaining insights into the inter-connectedness and actions among diverse actors. In particular, the indirect effects, most were anticipated or known, were represented in a logical order within the framework of the intervention theory.

This thesis author anticipates that further developed or alternative intervention theories could be effectively applied to eco-labelling processes in order to explore the effects in more detail, including the negative effects and additional indirect effects. Additional studies of beneficial indirect effects will probably uncover other good examples and, in particular, may contribute to the knowledge on how to reinforce their synergistic and influential capacities.

Another research strand could be to connect applications of intervention theory of eco-labelling with intervention theories of other interventions that target the same or similar actors (horizontal packaging according to Vedung and van den Doelen (1998, p. 52) with the aim of deepening the knowledge of both attributability and synergistic effects. This thesis author suggests that this kind of understanding could contribute to improved success of individual eco-labelling schemes as a complement to analyses of the schemes' individual success factors.

This thesis author's purpose was not to build new theory or to even modify existing theories. Instead, this thesis has made a contribution to the empirical study of eco-labelling as a policy instrument and to expanded insights into the experiences of the applicability of intervention theory for complex systems. Moreover, the intervention theory proved to be a useful tool for the identification of areas where the effects of eco-labelling are less well known. This thesis author's conclusion from this application is, and that is the beauty of it, that it can probably be used for shaping the eco-label as a policy intervention tool; therefore it can have future benefits in this entire field.

6.3 Recommendations and suggestions for future research

Evaluation parameters

There are commonly accepted overall goals of eco-labelling but clear and specified goals for the operations are rare. This situation makes future evaluations difficult. The initiating policy-makers or the managers of the eco-labelling schemes should outline specific goals and suggest suitable indicators for goal-achievements. Preferably, these indicators should be defined in a measurable manner and within a system for continuous data collection that should be established in order to capture fluctuations and the

dynamics of the effects and to continue to foster improvements in products and services.

This is important since the scheme's managers and product criteria development teams need guidance for their on-going work. Clearly specified goals and indicators will assist future evaluators and, in particular, will help them to be able to better detect, monitor and to report on such changes since the usual evaluations tend to only provide static snap-shots of the situation at the time of the evaluation.

Quantifications of direct effects

It is now commonly accepted to use various proxy indicators for the examination of effects of eco-labelling. An easy-to-use method for checking the status of an eco-labelling scheme was proposed in Section 5.3.7 in this thesis and in Paper II.

The likely explanation of the fact that there have been only a few attempts to describe the effects, in particular environmental effects, in quantitative terms is due to the difficulties and resource-intensity in collection of adequate information. Thus, it is recommended that approaches and methods to quantify or quantitatively estimate the environmental benefits of eco-labelling schemes should be developed, tested and applied for a sufficiently long period of time so as to document the potential capacity of eco-labelling. A possible step-by-step approach is outlined in Paper II and briefly explained in Section 5.3.5. It should be acknowledged that it must be elaborated for every product group separately.

It is in the interest of the future of eco-labelling schemes to be able to provide more accurate information on achieved environmental benefits. It is, further, likely that quantified information will be demanded for various reasons in the future, for instance from funding bodies and policy-makers. In the Nordic context, it could be a shared responsibility between the Nordic Council of Ministers (NCM) and the Nordic Ecolabelling Board (NMN).

Explore potentials of indirect effects

Because knowledge on indirect effects is currently inadequate, this thesis author recommends that additional research should be done on developments of quantification methods of the indirect effects as well as on the indirect environmental benefits. There may be additional unanticipated,

indirect effects detected, which are complementing those currently highlighted via intervention theory. It is also desired to examine the different outcomes or indirect effects from largely similar situations. It is important to learn, in this context, more about what inherent conditions must be fulfilled for the different indirect effects to occur.

A reasonable starting point is to collect and to analyse good examples of indirect effects in order to make them better known. They could serve as sources of inspiration for others. In case the indirect effects are for the benefits of license holders, the eco-labelling schemes are the prime actors to document and present the examples. In other cases, for instance indirect effects from enhanced consumer awareness, consumer agencies and similar organisations should take the lead. Ultimately, this is a matter of knowledge transfer between and among different schemes; therefore it can be an important a task for the Global Ecolabelling Network (GEN).

Synergistic policy interventions

In line with the further exploration of indirect effects, it is clear that other policy interventions influence eco-labelling and can achieve synergetic effects. As an alternative to conventional evaluations of eco-labelling schemes, this thesis author proposes that the policy-makers, who are responsible for the overall combinations of policy interventions, should develop combined evaluations of eco-labelling and related instruments, such as other kinds of information campaigns for producers and the public, promotion of environmental management systems (EMS), green design guides, green professional procurement, etc., in order to find powerful combinations and to refine the combinations. This thesis author is confident that such studies will contribute much to the knowledge about the attributability of different interventions; this could lead to valuable spin-off benefits. Other research may be designed to investigate the policy context of successful eco-labelling schemes, which can provide useful information for policy makers who wish to introduce or support existing eco-labelling schemes. This kind of study can serve as a complement to more traditional examinations in order to evaluate a particular scheme against established success criteria.

References

Aalto, K., Heiskanen, E., Leire, C. & Thidell, Å. (2008). *The Nordic Swan – From past experiences to future possibilities. The third evaluation of the Nordic eco-labelling scheme.* TemaNord 2008:529. Copenhagen: Nordic Council of Ministers.

Arnfalk, P., Brorson, T. & Thidell, Å. (2008). *Miljöarbete inom svensk tillverkningsindustri – En färd från myt till verklighet [Environmental management in the Swedish manufacturing industry – a journey from fiction to fact].* IIIEE Lund University.

Backman, M., Lindhqvist, T. & Thidell, Å. (1995a). *Nordisk Miljömärkning [Nordic Eco-labelling].* TemaNord 1995:594. Copenhagen: Nordic Council of Ministers.

Backman, M., Lindhqvist, T. & Thidell, Å. (1995b). The Nordic white swan: Issues concerning some key problems in environmental labelling. In E. Stø, *Sustainable consumption* (447-477). SIFO working report no 2-1995.

Bemelmans-Videc, M.-L. (1998). Introduction: Policy instrument choice and evaluation. In M.-L. Bemelmans-Videc, R. C. Rist & E. Vedung, *Carrots, Sticks and Sermons: Policy Instruments and Their Evaluation.* New Brunswick, NJ and London: Transaction Publishers.

Björk, P. (1997). *The effects of green labels on consumer decision making.* Swedish School of Economics and Business Administration.

Bjørner, T. B., Hansen, L.G. & Russel, C. S., Olsen, T. (2002a). *The effects of the Nordic Swan label on consumers' choice.* AKF Danish institute of local government studies. AKF Forlaget.

Bjørner, T. B., Hansen, L.G. & Russel, C. S. (2002b). Environmental labeling and consumers' choice – an empirical analysis of the effect of the Nordic Swan. *Journal of Environmental Economics and Management, 47,* 411-434.

Boström, M. & Klintman, M. (2008). *Eco-standards, product labelling and green consumerism.* Palgrave Macmillan.

BSI PAS 2050:2008 - Specification for the assessment of the life cycle greenhouse gas emissions of goods and services.

Cadman, J. & Dolley, P. (2004). *The direct and indirect benefits of the European Ecolabel.* AEA Technology, Report commissioned by DG Environment EU Commission.

Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91. OJ I 189, 20.7.2007.

DG Environment. (n.a.). *Ecolabel and Carbon Footprint.* [Online]. Available: http://ec.europa.eu/environment/ecolabel/about_ecolabel/carbon_footprint_en.htm [2009, October 5].

Edlund, S., Leire, C. & Thidell, Å. (2002). *Svanens roll i förhållande till andra miljöinformationssystem och miljöledning [The role of the Swan in relation to other environmental information systems and environmental management]*. TemaNord 2002:517. Copenhagen: Nordic Council of Ministers.

Environmental Management Council. (n.a.). *EPD Climate Declaration. What is a climate declaration.* [Online]. Available: http://www.climatedec.com [2009, October 5].

Eskine, C. C. & Collins, L. (1997). Eco-labelling: Success of failure? *The Environmentalist, 17,* 125-133.

EU DG Enterprise and Industry (n..a.) *Eco-design of energy-using products.* [Online]. Available: http://ec.europa.eu/enterprise/eco_design/index_en.htm [2009, October 5].

EVER. (2005). *Evaluation of EMAS and Eco-label for their revision.* 26.12.2005. Report 2 Research findings, Part B The Eco-label.

GEN. (n.a.). *A member's guide to the Global Ecolabelling Network's internationally coordinated ecolabelling system – GENICES*. Global Ecolabelling Network. [Online]. Available: http://www.globalecolabelling.net/pdf/genices.pdf [2009, October 5].

Grolleau, G., Ibanez, L. & Mzoughi, N. (2009). Too much of a good thing? Why altruism can harm the environment? *Ecological Economics, 68, 7,* 2145-2149.

Heidenmark, P., Jönsson, K., Lindhqvist, T. & Thidell, Å. (2001). *Evaluation of the environmental effects of the Swan eco-label – final analysis.* TemaNord 2001:516. Copenhagen: Nordic Council of Ministers.

Heiskanen, E., Kärnä, A., Niva, M., Timonen, P., Munch af Rosenschöld, E., Pripp, L. & Thidell, Å. (1998). *Environmental improvement in product chains.* TemaNord 1998:546. Copenhagen: Nordic Council of Ministers.

Hildén, M., Lepola, J., Mickwitz, P., Mulders, A., Palosaari, M., Similä, J., Sjöblom, S. & Vedung, E. (2002). *Evaluation of environmental policy instruments – a case study of the Finnish pulp & paper and chemicals industries.* Monographs of the Boreal Environment Research, No 21. Helsinki: Finnish Environment Institute.

Hirsbak, S., Nielsen, B. & Lindhqvist, T. (1990). *Eco-Products. Proposal for an European Community Environmental Label.* Prepared for the Commission of the European Communities. DTI.

Häβler, R., Mahlmann, I. & Schoenheit, I. (1998). *Assessing the success of the German eco-label. Examination of the effectiveness of the label from a viewpoint of companies using the label and chosen experts.* The Federal Ministry for the Environment, Conservation, and Reactor Safety. Report No UBA-FB 1998.

IFOAM. (n.a.). *The IFOAM Organic Guarantee System Revision.* [Online]. Available: http://www.ifoam.org/about_ifoam/standards/ogs.html [2009, October 5].

ISO 14020:1998 – Environmental labels and declarations – General principles.

ISO 14021:1999 – Environmental labels and declarations –Self-declared environmental claims (Type II environmental labelling).

ISO 14024:1999 – Environmental labels and declarations –Type I environmental labelling – Principles and procedures.

Johansson, A. (1992). *Clean technology*. Lewis Publishers.

Kogg, B. & Thidell, Å. (2003). *Utvärdering av system för egendeklarationer av farliga kemiska ämnen i varor – Exempel från byggsektorn och textilindustrin [Evaluation of self-declaration systems of hazardous chemical substances in articles – Examples of buildning materials and textile industries]*. Report 2/03. Stockholm: The Swedish Chemicals Agency.

Källebring, N. (2009). *Vardagen och miljön [Everyday life and the environment]*. Report commissioned by the Swedish Consumer Agency, Synovate Sweden.

Leeuw, F. & Vaessen, J. (2009). *Impact evaluations and development*. Washington DC: NONIE.

Leire, C. & Thidell, Å. (2005a). Indirect effects of eco-labelling – the case of purchasing tools. In *Conference procedure paper for LCM 2005 – Innovation by life-cycle management*. Volume 2, Barcelona, September 5-7, 2005.

Leire, C. & Thidell, Å. (2005b). Product-related environmental information to guide consumer purchases - a review and analysis of research on perceptions, understanding and use among Nordic consumers. *Journal of Cleaner Production, 13,* 1061-1070.

Leire, C. & Thidell, Å. (Forthcoming). Green public procurement and the applicability of eco-labelling. Paper submitted to *Journal of Cleaner Production*.

Leire, C., Thidell, Å., Helgadottir, B., Gislason, S., Pylvänäinen, E. & Niva, M. (2004). *Consumer perceptions, understanding and use of product related environmental information - A literature review of the Nordic knowledge base*. TemaNord 2004:539. Copenhagen: Nordic Council of Ministers.

Lönn, B.-E., Nordic Coordinator, personal communication, 16 Sept. 2009.

Mickwitz, P. (2003). A framework for evaluating environmental policy instruments – Concepts and key concepts. *Evaluation, 9, 4,* 415-436.

Mickwitz, P. (2006). *Environmental policy evaluation: Concepts and practices*. Doctoral dissertation. Commentationes scientiarum socialium 66, The Finnish society of sciences and letters.

Miljödatanämnden. (1982). *Blågul miljö [Blue-yellow environment]*. Prisma.

Morris, J. (1997). *Green goods? Consumers, product labels and the environment*. IEA Studies on the environment, No. 8. IEA.

Nilsson, H., Tunçer, B. & Thidell, Å. (2002). The use of eco-labelling like initiatives on food products to promote quality assurance – is there enough credibility? *Journal of Cleaner Production, 12,* 515-524.

Nordic Eco-Labelling Board. (2001). *Nordic Ecolabelling Steps.* [Online]. Available: http://www.ymparistomerkki.fi/files/490/engsteps.pdf [2009, October 5].

Nordic Eco-Labelling Board. (n.a.). *Svanens krav til treråvare.* [Online]. Available: http://www.ecolabel.no/data/f/0/07/17/7_2401_0/skogkrav_svanen.pdf [2009, October 5.

OECD. (1994). *Environmental labelling in the OECD countries.* Paris.

Paulavets, K. (2008). *Climate change and the food industry – Climate labelling for food products: potentials and limitations*. Copenhagen: Øresund Food Network/Øresund Environment Academy.

Purcell, A. H. (1977). Principles and creation of non-waste technology (NWT) and production. *Resources policy, 3, 1,* 74-74.

Rubik, F. & Frankl, P. (2005). *The future of eco-labelling: Making environmental product information systems effective.* Greenleaf publishing.

Rubik, F., Scheer, D. & Iraldo, F. (2008) Eco-labelling and product development: potentials and experiences. *International journal of Product Development, 6, 3-4,* 393-419.

Salzman, J. (1991a). *Environmental labelling in the OECD countries.* Paris: OECD.

Salzman, J. (1991b). Information exchange among labelling programmes. In *Global environmental labelling* (7-12), Proceedings from International expert seminar, September 24-25, 1991, Lesvos, Greece. Mytilene: Greece: University of the Aegean.

Schisser, P. & Shinn, M. (2004). *EEB evaluation of the European Eco-label criteria and scheme "What we wanted – what we got"*. European Environmental Bureau.

Thidell, Å. (Forthcoming). Evaluation of European eco-labelling schemes: methods, measures and effects. Paper submitted to *Journal of Cleaner Production.*

Tojo, N. (2004). *Extended producer responsibility as a driver for design change – Utopia or reality?* Doctoral dissertation. IIIEE Lund University.

US EPA. (1993). *Status report on the use of environmental labels worldwide.* EPA 742-R-9-93-001. Washington DC: Abt Associates Inc.

US EPA. (1994). *Determinants of effectiveness for environmental certification and labeling programs.* EPA 742-R-94-001. Washington DC: Abt Associates Inc.

US EPA. (1998). *Environmental labelling issues, policies, and practices worldwide.* EPA 742-R-98-009. Washington DC: Abt Associates Inc and Gary Davis.

Vedung, E. & van den Doelen, F. (1998). Public Information Programs in the Policy Process: Choice, Effects, and Evaluation. In M.-L. Bemelmans-Videc, R. C. Rist & E. Vedung, *Carrots and Sticks, and Sermons: Policy Instruments and Their Evaluation* (103-128). New Brunswick, NJ and London: Transaction Publishers.

Vedung, E. (1997). *Public policy and program evaluation.* New Brunswick, NJ and London: Transaction Publishers.

Wilske, Å. (1999). *Miljöutvärdering av Bra Miljöval för hushållskemikalier [Environmental evaluation of the Good Environmental Choice for household cleaning products]*. Report for the Swedish Society for Nature Conservation (SSNC), March 1999. Gothenburg: Scandiakonsult Sverige AB.

ÅF-IPK. (2000a). *Utvärdering av svanmärkningen. Del A: Direkta effekter [Evaluation of the Swan labelling. Part A: Direct effects]*. Stockholm: ÅF-IPK.

ÅF-IPK. (2000b). *Utvärdering av svanmärkningen. Del B: Synergieffekter [Evaluation of the Swan labelling. Part B: Synergistic effects]*. Stockholm: ÅF-IPK

.

Web-sites

Ecolabelling Denmark [http://www.ecolabel.dk/ 5.9.2009]

Ecolabelling Iceland/The Environmental Protection Agency [http://www.ust.is/Umhverfismerki/]

Ecolabelling Norway [http://www.ecolabel.no/]

Global Ecolabelling Network [http://www.globalecolabelling.net/]

Nordic Council of Ministers eco-labelling [http://www.norden.org/en/nordic-council-of-ministers/council-of-ministers/council-of-ministers-for-the-environment-mr-m/institutes-co-operative-bodies-and-working-groups/co-operative-bodies/the-swan-ecolabel?set_language=en&-C=]

Nordic Eco-labelling [http://www.ecolabel.nu/nordic_eco2/welcome/5.9.2009]

SFS Ecolabelling Finland [http://www.ecolabel.fi/]

SIS Ecolabelling [http://www.svanen.nu/]

TCO Development [http://www.tcodevelopment.com/]

Appendix 1 – Early goals and objectives of eco-labelling

The table below is a compilation of goals and objectives for eco-labelling schemes as expressed in various publications.

Reference	Goals/Objectives
Hirsbak, S., Nielsen, B. & Lindhqvist, T. (1990). *Eco-Products. Proposal for an European Community Environmental Label.* Prepared for the Commission of the European Communities. DTI. (pp. ii-iii)	The objectives of an EC Environmental labelling system are: • To inform consumers that, by their purchase of "Environmentally sound" products, they can help to improve the environment; • To encourage manufacturers and product designers to market products that are more "Environmentally sound". The labelling system is only the vehicle and mechanism to help to achieve these objectives
Salzman, J. (1991b). Information exchange among labelling programmes. In *Global environmental labelling* (7-12). Proceedings from International Seminar, Sept. 24-25 Lesvos, Greece.	Eco-labelling programmes are one way to: • Combat the flood of misleading and false environmental advertising. • Provide accurate information to consumers • And a useful marketing instrument to producers.
Salzman, J. (1991a). *Environmental labelling in the OECD countries.* Paris: OECD. (pp. 12-13)	Environmental labelling can accomplish a number of goals, including: • Improving the sales or image of a labelled product; • Raising the awareness of consumers; • Providing accurate information; • Directing manufacturers to account for the environmental impact of their products; • Protect the environment.

Reference	Goals/Objectives
US EPA. (1993). *Status report on the use of environmental labels worldwide.* EPA 742-R-9-93-001. Abt Associates Inc. (p. 9)	As a policy instrument, labelling can influence marketplace behaviour, guiding consumers and producers to act towards public policy goals.
US EPA. (1994). *Determinants of effectiveness for environmental certification and labeling programs.* EPA 742-R-94-001. Abt Associates Inc. (p. 5)	They aim to educated consumers and change their purchase behaviour, their ultimate goal is to reduce the environmental impacts from the manufacture, use, and disposal of consumer products and services. By changing consumer purchasing behaviour and attitudes and encouraging manufacturers to develop products and manufacturing processes that are less harmful to the environment.
OECD. (1994). *Environmental labelling in the OECD countries.* Paris: OECD. (pp. 13-14)	The ultimate goal of environmental labelling scheme is to reduce the burden on the environment from various stages of products. Stated goals and objectives of environmental labelling schemes differ slightly by each scheme. The general purpose can be expressed as: • Setting and providing consumers with credible rules for environmental purchase decision; • Providing manufacturers a level playing field for fair competition; • Raising environmental awareness of consumers; • Improving the sales of labelled products and improving image of enterprise; • Encouraging the production of greener products; • Protect the environment. The ultimate benefit of environmental labelling is to reduce undesirable environmental impact by encouraging the production and consumption of more environmentally benign products.

Reference	Goals/Objectives
US EPA. (1998). EPA 742-R-98-009. *Environmental labeling issues, policies, and practices worldwide.* Abt Associates Inc and Gary Davis. (p. 35)	All environmental labelling programs aim to improve some aspect of environmental quality. [They] work towards this goal by recognising manufacturers that produce and market products that are (relatively) less harmful to the environment and by encouraging consumers to purchase products labelled as environmentally preferable. If consumers buy environmentally preferable products due to label information, it's hoped that market forces will encourage other producers to change their manufacturing procedures to reduce environmental harm.
ISO 14024:1999 – Environmental labels and declarations – Type I environmental labeling – Principles and procedures	The overall goal of environmental labels and declarations is, through communication of verifiable and accurate information, that is not misleading, on environmental aspects of products and services, to encourage the demand for and supply of those products and services that cause less stress on the environment, thereby stimulating the potential for market-driven continuous environmental improvement. The objective of Type I environmental labelling programmes is to contribute to a reduction in the environmental impacts associated with products, through the identification of products that meet a specific Type I programme's criteria for overall environmental preferability.

Appended papers

The following articles are appended to the thesis:

Paper I: Leire, C. & Thidell, Å. (2005b). Product-related environmental information to guide consumer purchases – a review and analysis of research on perceptions, understanding and use among Nordic consumers. *Journal of Cleaner Production, 13,* 1061-1070.

Paper II: Thidell, Å. (Forthcoming). Evaluation of European eco-labelling schemes: methods, measures and effects. Paper submitted to *Journal of Cleaner Production.*

Paper III: Nilsson, H., Tunçer, B. & Thidell, Å. (2002). The use of eco-labelling like initiatives on food products to promote quality assurance – is there enough credibility? *Journal of Cleaner Production, 12,* 515-524.

Paper IV: Backman M, Lindhqvist, T, & Thidell, Å. (1995b). The Nordic white swan: Issues concerning some key problems in environmental labelling. In E. Stø, *Sustainable consumption* (447-477), SIFO working report no 2-1995.

Paper V: Leire, C. & Thidell, Å. (Forthcoming). Green public procurement and the applicability of eco-labelling. Paper submitted to *Journal of Cleaner Production.*

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Paper I

Leire, C. & Thidell, Å. (2005b). Product-related environmental information to guide consumer purchases – a review and analysis of research on perceptions, understanding and use among Nordic consumers. *Journal of Cleaner Production, 13,* 1061-1070.

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Thidell, Å. (Forthcoming). Evaluation of European eco-labelling schemes: methods, measures and effects. Paper submitted to *Journal of Cleaner Production.*

Paper III

Nilsson, H., Tunçer, B. & Thidell, Å. (2002). The use of eco-labelling like initiatives on food products to promote quality assurance – is there enough credibility? *Journal of Cleaner Production, 12,* 515-524.

Paper IV

Backman, M, Lindhqvist, T, & Thidell, Å. (1995b). The Nordic white swan: Issues concerning some key problems in environmental labelling. In E. Stø, *Sustainable consumption* (447-477), SIFO working report no 2-1995.

Paper V

Leire, C. & Thidell, Å. (Forthcoming). Green public procurement and the applicability of eco-labelling. Paper submitted to *Journal of Cleaner Production.*

IIIEE Dissertations

Helen Nilsson
Finding a Balance. Placing Farmers' Markets in the context of sustainability in modern society
IIIEE Dissertations 2009:4

Dagmara Nawrocka
Extending the Environmental Focus to Supply Chains. ISO 14001 as an inter-organizational tool?
IIIEE Dissertations 2009:3

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Influences, effects and changes from interventions by eco-labelling schemes

What a Swan can do?

The Nordic Swan is the official eco-labelling scheme in the Nordic countries since 1989. Eco-labelling is a voluntary and informative market-based policy instrument designed to help stimulate environmentally sound product development and to provide consumers accurate information about more environmentally sound products and services. The Swan has reached a wide recognition among consumers in the Nordic countries. Based on a number of evaluations and other studies of the Swan, the effects and influences of eco-labelling are examined in this thesis. The focus of the research is on how various effects have been detected, documented and measured. Despite the fact that few effects have been well measured, it is concluded that the eco-label has contributed to more environmentally benign products and services. Moreover, criteria documents, requirements and information generated by the eco-labelling scheme have been used in several other applications and thereby have caused and are causing positive indirect effects beyond the intended scope of the eco-label. The thesis author's conclusions highlight the need for improved measurement methods, systematic study and understanding of both the direct and indirect effects. Additionally, recommendations are made of future work that should be done to better understand the potential of how eco-labelling schemes can effectively and synergistically interact with and build upon other policy instruments designed to help society make the transition to more sustainable consumption and production.

IIIEE Dissertation 2009:5
The International Institute for
Industrial Environmental Economics
Lund University, Sweden
ISSN 1402-3016
ISBN 978-91-88902-54-2

LUND UNIVERSITY