

Eco-labelling criteria development for strategic life cycle management

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(for format: see and use example below: use full first name and full family name with a first capital letter only)

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Abstract To accelerate the transition towards a sustainable society, changes in consumption and production decisions are crucial. Eco-labelling type I is an instrument with a potential to create incentives for changes towards strategic life cycle management along value chains to achieve products that aid society's compliance with sustainability principles. But the mere existence of the instrument is not enough to utilize this potential. In a previous study, applying a Framework for Strategic Sustainable Development as a foundation for the analysis, we have pointed at deficiencies in theory and process of eco-labelling which hamper cohesiveness, transparency and comprehension. In this paper, we present a prototype criteria development process and discuss it in relation to current processes. From this comparison we conclude that the new criteria development process has the potential to support strategic life cycle management.

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1 Introduction

To accelerate a societal transition towards sustainability radical changes in consumption and production patterns will be needed, and the advocates for a role of eco-labels in fostering this change are numerous. This role of eco-labels as a way to encourage consumers to adopt more sustainable consumption patterns was recognized and captured in Agenda 21, during the Rio Earth Summit in 1992. Ten years later, in the World Summit on Sustainable Development (WSSD) in Johannesburg unsustainable patterns of consumption and productions are

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addressed. The Plan of Implementation [1] advocates „developing and adopting on a voluntary basis effective, transparent, verifiable, non-misleading and non-discriminatory consumer information tools“. These characteristics are also captured in the eco-labelling type I standard by the International Organization for Standardization in its efforts to structure and differentiate among different environmental labels.

Starting in the late 1970s with the German Blue Angel the majority of national type I third-party labelling schemes emerged in the late 1980s or early 1990s. Along with this proliferation of type I eco-labels or type I-like labels, many questions have been raised about the effectiveness of eco-labels [2]. A recent assessment of the criteria development processes within two leading eco-labelling programmes point at deficiencies in theory and process from a strategic sustainability perspective, which hampers cohesiveness, transparency, and comprehension [3]. These deficiencies also hamper the potential for strategic life cycle management.

The aim of this study is to sketch out a prototype for how, in principle, a criteria development process for eco-labelling type I schemes could integrate a strategic sustainability perspective and thereby support strategic life cycle management.

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2 Methods

2.1 Data collection

This prototype development builds on data collected in interviews with criteria developers at two eco-labelling type I programmes and a study of criteria development documents. A case study at a governmental expert body for green procurement, in which two criteria development processes were shadowed, have also provided information on current criteria development processes. This included physical attendance through the processes and semi-structured interviews with process leaders and members of the working group representing different stakeholders.

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2.2 Exploration method

The data has been assessed from a strategic sustainability perspective by using an adaption of a generic framework for strategic sustainable development (FSSD) [4-

8]. This framework is utilizes backcasting from a principled definition of sustainability - a situation when products¹ do not contribute to systematic degradation of socio-ecological systems. The findings from these previous assessments and a previously developed tool - templates for sustainable product development (TSPD) [9] - are here used as a basis for describing desired properties and characteristics of a criteria development process prototype. The TSPD addresses - now and in a desired future - the human service/utility of the product, the product concept and an 'extended enterprise' cross-sectoral perspective. The TSPD aims at widening the scope from only some currently known product impacts to the remaining gap to sustainability. The target group of the tool was initially product developers, senior managers and sustainability specialists, but in this paper we adapt it for a new target group, i.e the criteria developers, for eco-labelling type I schemes, to develop templates for sustainable criteria development (TSCD).

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3 Results

The main gaps found in the assessment of criteria development processes within eco-labelling type I programmes are presented in table 1.

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Tab.1: Result from the assessment of criteria development processes within type I eco-labelling

Level	Description of the level	Gaps
System level	The system in which all planning and acting is taking place. Organizations within society within the biosphere, including the social and ecological laws/rules/norms which govern this system.	Lack of a full system perspective, i.e., the criteria were not attempted to cover the necessary range of aspects within the ecological and social systems of which the products are part. There is no long-term perspective within the process. Each new round of criteria is derived from impacts in the

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¹ Products here include physical artefact, software, processes, services and combinations of these.

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		current situation without any clear aims as regards future criteria.
Success level	Definition of the objective / successful outcome including compliance with sustainability principles.	There is no clear, agreed upon, and within the criteria development working group understood, objective.
Strategic level	Guidelines for strategic selection of actions to achieve the objective.	Lack of strategic guidelines. A selection of different impacts is in focus, and producers are invited to discuss those, but how the selection, or prioritization, is made is not clearly presented. The potential to create a common understanding and sustainability dialogue on responsibilities within an extended stakeholder network is not utilized all along the chain and to proactively steer decisions is weakly utilized.
Action level	Actions that help move the entity/organization/process towards the objective. This means actions that are prioritized and carried out in line with the strategic guidelines to achieve success in the system.	In the absence of a clear definition of any objective there are no strategies either. Consequently there has been no room for exploring the "actions" within the criteria development process in that context.
Tools level	Methods, tools and concepts used to decide on, manage, measure and	Lack of data and information transmission tools. This lack is allowed

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	monitor actions.	to affect the criteria.
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With these gaps identified the following list of desired properties for each of the criteria development steps has been developed (see also figure 1) with the aim to fill the gaps.

- 1) The selection of product and pre-study step should:
 - Include the identification of sustainability hot-spots throughout the full life cycle of the product category.
 - Create an understanding of what current market desires the product category is intended to meet and how the relationship between human needs, market desires and satisfiers (products) may change on a sustainability-driven market.
 - Create an understanding of what current aspects, including management routines, that are critical in each life-cycle stage of the product category when reviewed from a full sustainability perspective.
 - Include stakeholder mapping of the product category concept, including current as well as likely future value-chain cooperations that would be favourable for strategic movements towards sustainable situations throughout the lifecycle.
 - Assure that the product category boundaries are informed by the function/utility that the product category should help deliver to the consumer.

- 2) The criteria development step should:
 - Include a shared vision of how the function/utility delivered by the product category can be provided within the constraints of sustainable life cycle management.
 - Be supported by strategic guidelines promoting criteria that (i) aid fulfillment of the sustainability principles, (ii) are flexible platforms (good grounds) for forthcoming criteria towards fulfillment of sustainability principles and as such (iii) represent a good balance between advancement speed and return on investment (ensuring a sufficient resource influx to ensure continuation of the transition process).
 - Allow for short- and long-term options for developing product categories towards sustainability. Strategies for future criteria should be made

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publicly available together with current criteria documents to support stakeholders to be pro-active in their long-term strategies.

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3) All steps of the criteria development process should:

- Be in compliance with ISO 14020 and ISO 14024.
- Consider all principles and core subjects in the ISO 26000 guidance standard.
- Be practically manageable for the users of it.
- Include a participative involvement of the full value chain of the product category.

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Prototype description

The prototype of the criteria development process is presented in figure 1. This figure visualizes both the main steps in existing processes as well as how a strategic sustainability perspective can be integrated on a principal level.

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The adaption of TSPD into TSCD are further described in table 2 including examples of questions for each template section. These sections embraces (i) human utility/market desires, (ii) product concept and (iii) extended enterprise - all in the present situation as well as in a desired future. 'Extended enterprise' means the wider community of stakeholders that influence or could influence the performance of the enterprise from a full sustainability and full life cycle point of view (e.g. also legislators, authorities and political institutions).

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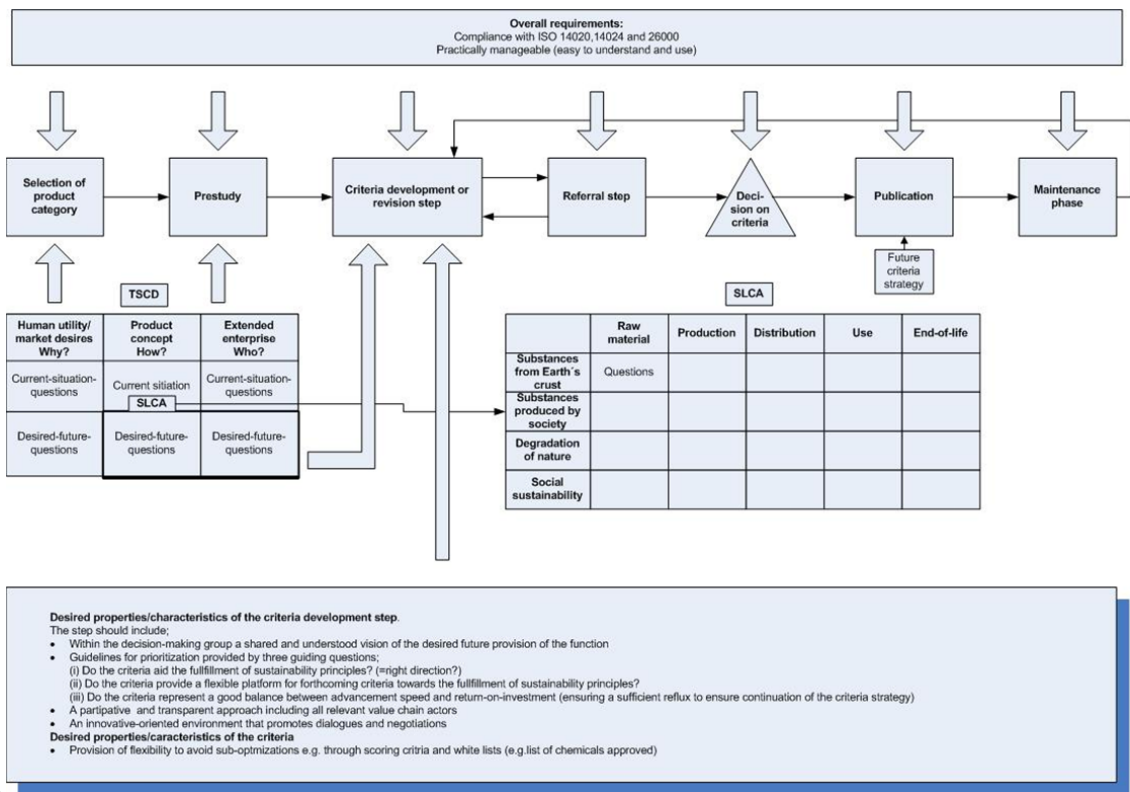


Fig. 14 Criteria development process prototype .

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Table 2 Templates for sustainable criteria development (TSCD)

	Human utility / Market desires / =Why?	Product concept =How?	Extended enterprise =Who?
Current situation	<p>Q1 - What is the desired function from the market?</p> <p>Q2 How does this function relate to basic human needs?</p> <p>Q3 - What overall sustainability problems relate to the market desires?</p>	<p>Q1 - What current flows and management routines are critical from a sustainability perspective?</p> <p>This box is supported by a Strategic Life Cycle Assessment (SLCA) described in table 3a and 3b.</p>	<p>Q1- What does the stake-holder map look like for the product? (this include all stakeholders connected to any activity in which the product plays a role within the life cycle of the unit).</p> <p>Q2 -What current stakeholder preferences and /or conditions from a societal perspective are opposing the introduction of an eco-label?</p> <p>Q3 -What current stake-holder cooperation is agreed upon?</p>
Desired future	<p>Q1 - What new market desires is likely to evolve in the future as a response to current overall sustainability challenges?</p>	<p>Q1 - What new flows and management routines could be developed as a response to the Strategic Life Cycle Assessment.</p>	<p>Q2 What value chain cooperation is favourable for a strategic sustainable life cycle management and how can labelling criteria aid this cooperation?</p>

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			Q2 - What-roles and responsibilities can be detailed and agreed upon?
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To support the identification of critical flows and management routines from a sustainability perspective each life-cycle phase is assessed against principles for sustainability, in a Sustainability Life Cycle Assessment, (SLCA) matrix [10], and an example is presented in table 3a and 3b. In the tables we show examples of sustainability risk aspects that are addressed in the life cycle phases raw material, production and distribution (table 3a) and the user phase and end-of-life phase (table 3b).

Table 3a Sustainability Life Cycle Assessment matrix with examples of sustainability aspects addressed

Sustainability principle (SP)* /Life cycle phase	Raw material phase	Production phase	Distribution phase
SP 1	Virgin mined material Mined material scarce in nature Energy source/consumption	Mined materials/scarcity Energy source/consumption	Mined material/scarcity Energy source/consumption
SP 2	Persistent man-made substances in extraction/leakage	Persistent man-made substances in production/leakage	Persistent man-made substances in distribution systems/leakage
SP 3	Systematic degradation of nature by physical means	Systematic degradation of nature by physical means	Systematic degradation of nature by physical means
SP 4	Human rights, labour conditions, local communities	Human rights, labour conditions, local communities	Human rights, labour conditions, local communities

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Table 3b Sustainability Life Cycle Assessment matrix with examples of sustainability aspects addressed

Sustainability principle (SP)* Life cycle phase	User phase	End-of-life phase
SP 1	Need for mined materials Scarcity Energy consumption	Processes involved free from mined materials/scarcity Energy source/consumption
SP 2	Need for man-made substances/leakage Dissipation	Processes free from man-made substances/leakage
SP 3	Systematic degradation of nature by physical means	Systematic degradation of nature by physical mean
SP 4	Health, safety, integrity, user information	Human rights, labour conditions, local communities

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*The sustainability principles:

In a sustainable society, nature is not subject to *systematically* increasing...

- 1... concentrations of substances from the Earth's crust
- 2... concentrations of substances produced by society
- 3... degradations by physical means

And in that society...

- 4... people are not subject to conditions that systematically undermine their capacity to meet their needs.

4 Discussion

Supply chains from raw material extraction to consumption are often complex, involving a great number of production steps, actors, and nations.

Eco-labelling has a potential and aim to create a simplified view of and improved influence on the product life cycle, i.e. to create incentives for and support life cycle management. This potential is currently not utilized from a strategic sustainability perspective which is a missed opportunity. In this paper we present how gaps from a strategic sustainability perspective within eco-labelling type I programmes can be bridged on a principled level. In this paper we also introduce templates for strategic criteria development (TSCD) into a criteria development process prototype, described on a principled level. The prototype seems theoretically capable of delivering the following:

- An improved view and control of the product category life-cycle from a strategic sustainability perspective, including the physical as well as the functional life cycle
- Clearer roles and responsibilities within the extended stakeholder-network of the product category are identified and expressed in labelling criteria
- Levels of criteria are set at current attainable levels, ensuring a sufficient resource influx to ensure continuation to forthcoming criteria towards the fulfillment of sustainability principles
- The development of stakeholder strategies are supported by the communication of long-term strategies for the criteria
- A broader mind-set as regards the relationship between human needs, market desires and satisfiers (products)
- An enhanced environment for transfer of data and information

A function-oriented view, encouraging resource efficient out-of-the box solutions to meet human needs, is proposed. The TSPD approach has in earlier studies on product development pointed to a provision of an improved overview of sustainability implications of the product category studied, as well as the development of more comprehensive cooperation with societal stakeholders for the organization using it [9]. The shift in focus from a physical artefacts view towards more of a function view has been shown potent to create environmental improvements [11], as well as business and consumer opportunities ([12, 13] if strategically applied).

The prototype will be tested and developed further in future research.

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