

Chapter 6

Life Cycle Management: Labelling, Declarations and Certifications at the Product Level – Different Approaches

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Abstract The focus of this chapter is on *external communication of product features intended to provide professional, commercial and private consumers with information on the characteristics of products and services*. Mandatory approaches are distinguished from voluntary ones; the chapter is focused on the latter. Based on ISO standardization work, this chapter differentiates between qualitative, quantitative and self-declared voluntary approaches. Section 2 presents an overview of different concepts and approaches as tools applicable within Life Cycle Management. Section 3 deepens relevant approaches by describing some characteristic elements. Section 4 elaborates on a hierarchy, whereas the final Sect. 5 summarizes the outcomes and draws some conclusions.

Keywords External communication of product features • Consumers • Life cycle assessment • Life cycle management • Product-related information • Sustainability

1 Introduction

Life Cycle Management (LCM) is an umbrella term denominating a business management concept for sustainable products. It can be applied in the industrial and service sectors with the aim of minimizing environmental, social and economic burdens linked to a company's product, product portfolio and brand during its entire life cycle to enhance their overall sustainability performance and value chain. Thus LCM facilitates continuous improvements of product/systems in terms of their economic, social and environmental sustainability. The focus of this chapter is on *external communication of product features intended to provide professional,*

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commercial and private consumers with information on the characteristics of products and services. Such communication from manufacturers towards their clients is based on the insight that product information is – in most cases – asymmetrically allocated between buyers and sellers (Karl and Orwat 1999: 114). According to Nelson (1970) and Darby and Karni (1973), consumers are not able to judge all qualities of products. In order to cope with asymmetric information, consumers need support in their purchasing activities provided by different tools. There is a widespread arena of different approaches to transmit this information, there are *qualitative approaches* using symbols and logos, and there are *quantitative approaches* presenting quantitative and numeric information in different units. They intend to fill the information gap so-called credence goods leave behind, providing information transmission. They aim to establish a reliable and trustworthy information system regarding product features.

Section 2 presents an overview of different concepts and approaches as tools applicable within Life Cycle Management. Section 3 deepens relevant approaches by describing some characteristic elements. Section 4 elaborates on a hierarchy, whereas the final Sect. 5 summarizes the outcomes and draws some conclusions.

2 Overview on Different Approaches

The transmission of information between sellers – i.e. industry and business – and their clients is not only motivated by coping with asymmetric information, but by a series of driving forces (see UNEP 2006: 43) depending on the target audiences:

- *Private consumers* to get competitive advantage in emerging or new markets
- *Commercial business purchasers* to respond to requests of business in the supply chain or to compete on the business-to-business market
- *Public purchasers* to demonstrate compliance with Green Public Procurement (GPP) requirements
- *Societal stakeholders* to respond to requests and pressures from NGOs
- *Banking and finance* which are keen to judge technical and environmental risks of companies and their products
- *Policy makers and public administration* to deliver information and data to support them in policy decisions and to favour reasonable decisions

Communication between manufacturers and the mentioned target groups might take on different forms: oral, written, formalized, informal, standardized, etc. Some of them are mandatory, prescribed by national or international regulations, some are voluntary; Fig. 6.1 provides a classification of different approaches to transmitting information.

Mandatory approaches request that every producer or retailer introducing products in the market is obliged to fulfil prescriptions on the provision of product information. Compulsory product information refers often to the health and safety aspects of products, giving details of chemical substances contained within the

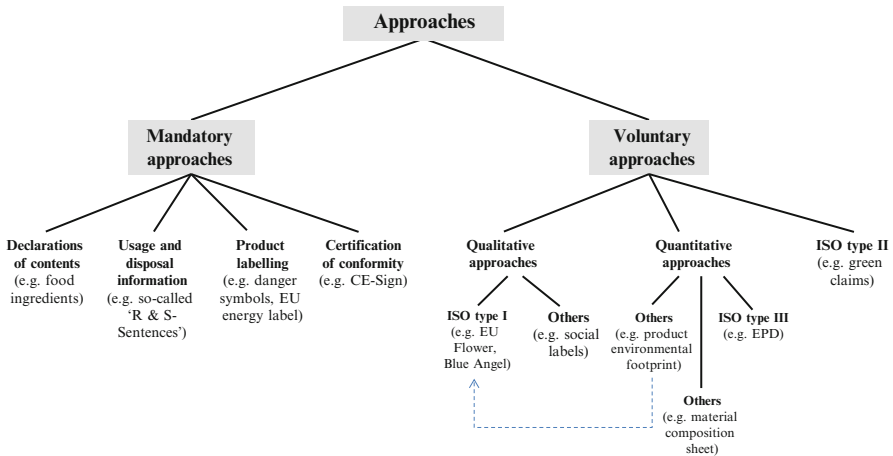


Fig. 6.1 Classification of different information transmission approaches (Source: Rubik and Frankl 2005: 34 (modified))

product or information on the proper usage and disposal of the product, other types are certificates of conformity of products with specific regulatory requirements. In contrast to compulsory approaches, *voluntary ones* leave to market actors the decision of whether to use it or not. There is a wide range of such approaches. Much effort has been made by the International Organisation of Standardisation (ISO) to structure environmental approaches which were subdivided into three types of voluntary labels:

- *ISO Type I labels (Eco-label)*: “Voluntary, multiple criteria-based third party programs that awards a licence authorising the use of environmental labels on products. These labels provide qualitative environmental information” (ISO 2000: 1). They are covered by ISO 14024 published in April 1999, last reviewed and confirmed in 2009.
- *ISO Type II labels*: “Self-declared environmental claim made by manufacturers, importers, distributors, retailers, or anyone else likely to benefit from such a claim without independent third-party certification” (ISO 1999: 3). They are covered by ISO 14021 published in 1999.
- *ISO Type III labels*: “Quantified environmental data using predetermined parameters and, where relevant, additional environmental information. Note 1: The predetermined parameters are bases in the ISO 14040 series of standards (...). Note 2: The additional environmental information may be quantitative or qualitative” (ISO 2006: 2). They are covered by ISO 14025 published in 2006.

Comparing these types of labels (see Table 6.1) several significant differences could be recognized: In general, the different schemes claim to fill the information gap by “condensing” information. The number criteria—the metrics—depend on the type: Type I and III cover multiple areas, whereas Type II one single area. The same

Table 6.1 Comparison of the three ISO labels

Criteria areas/metrics	Life cycle consideration
Type I: multiple Type II: single Type III: multiple	Type I: yes Type II: no Type III: yes
Selectivity	Third party verification/certification
Type I: yes Type II: no Type III: no	Type I: yes Type II: preferred Type III: yes

Source: GEN (2004: 12)

refers to the consideration of life-cycle: its examination is a core element of the types I and III and not requested by Type II. The symbol of the Type I indicates that requirements, which are (nearly) not visible on the label itself, were fulfilled. By doing so, it is selective: It “translates” quantitative and qualitative information and transmits them to the target groups. This means that a label allows them to distinguish between products with, and without, the label. Type II and III are not selective. The third party verification is another request of the types I and III, but not strongly requested by Type II.

3 Some Exemplary Information Transmission Approaches

In this section, we focus on three different approaches, namely qualitative approaches by labels, self-declared environmental claims and quantitative approaches.

3.1 *Qualitative Approaches*

3.1.1 Eco-Labels

Addressed Issues Eco-labels according to ISO type I should consider the entire life-cycle of a product based on scientific evidence, their application is voluntary and up to the decision of the applicants. They refer to environmental issues, like energy consumption, material composition, emissions, use of dangerous substances etc. They are intended to label products with considerable less environmental impacts than the market average along the life-cycle—i.e. the “best in the class”. These last few years, environmental topics have been supplemented by the integration of social criteria into some requirements of the eco-labels, e.g. working conditions, fair-trade issues.

Institutional Issues For each product group, criteria have to be developed and fixed. The criteria development is carried out in an open participatory process, e.g. by boards, committees, panels, expert groups representing different economic and social interests (e.g. trade, industry, consumer and environmental organisations). However, the final decision on requirements has to be taken by an institution independent from manufacturers and their interests. The fulfilment of the requirements has to be proven by a third-party verification procedure. Having passed the requirements, applicants receive the allowance to use the symbol of an eco-label scheme, which is restricted to a predefined period of some years. This restriction is intended to review the requirements and to update them, if needed, taking into account new technological developments, new information and other challenges.

Target Groups Mainly private consumers.

Status Eco-labels have been in place since 1978, when the German Blue Angel became the first voluntary eco-label scheme worldwide, followed just over a decade later (1989) by the Japanese Eco-Mark. Altogether, the labelling landscape has become more and more complex, and also confusing. According to Ecolabel Index,¹ 458 eco-labels in 197 countries covering 25 product groups exist: some are applied to a vast range of product groups whereas others are restricted to a single and specific product group. Globally, providers of eco-label schemes co-operate in the “Global Ecolabelling network” (see: <http://www.globalecolabelling.net/>).

Examples European eco-label “EU-Flower”, German Blue Angel, Scandinavian “Nordic Swan”, Australian “Good Environmental Choice”, Japanese “Eco Mark Program”, US “Green Seal” or the “Green label Thailand”.

3.1.2 Social Labels and Standards

Addressed Issues The consideration of environmental challenges is only one challenge, but due to the increasing “length” and complexity of supply chains, to the globalisation of markets and supply or production chains, and due to pressures from stakeholders, the social features along the chain gain increasing importance. Beside company and workplace related standards like ISO 26000 and SA8000, some labels cover social issues such as ban of child labour, social rights, labour union laws, fair prices, working conditions. However, a common international standard like the ISO 14020-series does not exist.

Institutional Issues The institutional characteristics depend on the requirements label scheme, in general reliable labels are independent from business and request an independent certification of the fulfilment of their requirements.

Target Groups Mainly private consumers, but also business and public purchasers.

¹<http://www.ecolabelindex.com/> (accessed March 5, 2015).

Status The increasing importance of social issues could be observed by the increasing number of labels dealing with this topic. The webpages of the Sustainability Compass (<http://www.sustainability-compass.com/>) or of the Standards Map (<http://www.standardsmap.org/>) offer a broad overview on social (and sustainability) labels.

Examples “Rugmark” label, “Fairtrade” label.

3.1.3 Certificates of Conformity

Addressed Issues The issues addressed are diverse and refer to specific needs. They might document for example sustainable forestry, fishery, and agriculture. The certificates document fulfilment of specific environmental requirements, which are often based on upstream challenges during resource extraction. The right to use a certificate allows their holders to distinguish their certified products from those of competitors and might offer market opportunities by positive discrimination.

Institutional Issues The institutional characteristics depend from the requirements label scheme, in general reliable labels are independent from business and request an independent certification of the fulfilment of their requirements.

Target Groups Private consumers, but also business and public purchasers.

Status A lot of different certificates of conformity have been developed, an overview is hard to get, but there are several webpages providing some overviews, e.g. the already mentioned ones of the Sustainability Compass, of the Standards Map or of [the Ecolabelindex](#). The Forestry Stewardship Council (FSC) provides certificates for companies which fulfil a number of forestry requirements; the requirements have been elaborated by the Forest Stewardship Council (FSC) which is an international organization with business, NGOs, trade unions and representatives of indigenous people. Applying companies need an independent verification of a certifier accredited at FSC.

Examples “FSC” (Forrest Stewardship Council) label, “MSC” (Marine Stewardship Council) label, “Rainforest Alliance” label.

3.2 *Self-Declared Environmental Claims*

Addressed Issues Self-declared environmental claims according to ISO 14021 depend from the interests of the business/industrial associations in charge of label. Beside environmental issues, also social issues might be highlighted.

Institutional Issues There are not specific institutional prescriptions; however the relevant national/international legislation (e.g. competition laws) has to be respected.

Target Groups Mainly private consumers.

Status Self-declared labels could be regarded as a business marketing approach to inform on the environmental qualities of their products by self-declaration. According to the ISO 14021 standard such labels do not require an independent third-party registration. The number of such labels has grown continuously. The perception and “reputation” of the labels depend on some strong parameters, like credibility of the creator, product group, market competition, etc. In general, especially NGOs suspect self-declared environmental labels and do not support them.

3.3 *Quantitative Declarations*

3.3.1 **Environmental Product Declarations (EPD)**

Addressed Issues In line with the ISO standard 14025, Environmental Product Declarations (EPD) provide quantified environmental data for a product with pre-set categories of parameters (product category rules, PCR). The data should be based on LCA tools and calculations and consider supply chains. They might be also highlight and restricted to some (or one single) environmental challenges – single-issue EPDs. EPD intend to compare a product of the information provider with other products of the specific product group.

Institutional Issues The product category rules have to be elaborated in a participatory consultation process involving stakeholders like business, NGOs etc. Companies presenting EPDs of their products have to verify the data according to the rules of the ISO 14040 series. The verification of data has to be carried out by independent verifiers.

Target Groups Mainly business (commercial procurers, public procurers, retailers).

Status In 1998, the Japan Environmental Management Association for Industry (JEMAI), with the support by the Japanese Ministry of Economy, Trade and Industry (MITI), started an experimental program for Type III environmental declarations which resulted in the EcoLeaf’s official launch in 1999. A global network of EPD-organizations and practitioners pushes the development of EPD’s (see <http://gednet.org/>). Recently, climate-related EPD’s focusing on climate relevant data came up.

Examples Japanese “Eco-Leaf”, “International EPD® System”.

3.3.2 **Product Footprint**

Addressed Issues The addressed issues depend on the objective of the footprint concept. An encompassing footprint refers to different environmental challenges, whereas the water footprint, for example, is restricted to water-related challenges.

Institutional Issues The institutional issues are still under development.

Target Groups Private consumers, commercial procurers.

Status The origin of different footprints is the concept of the ecological footprint (Rees and Wackernagel 1996) which were followed by different other footprint approaches (see Fang et al. 2014), like product water footprint, land footprint or carbon footprint.

However, of increasing importance are the ongoing efforts of the European Commission to create a Product Environmental Footprint. They have their origin in a communication of the European Commission (2008), which called for the elaboration of a product carbon footprint. Later, the Commission decided to extend the work to other environmental aspects resulting in a product footprint. The “Communication Building the Single Market for Green Products” (European Commission 2013a) and methodological recommendations (European Commission 2013b) pushed the further development. The Commission’s product footprint should be based on LCA, mentioned are the corresponding ISO standards of the 14040 series and some other concepts, it might consider 14 different impact categories. Like for EPD, for each product group so called “Product Environmental Footprint Category Rules” should be prepared and used for the proliferation of data.

In autumn 2013, a 3 year two stages-pilot phase started to elaborate and test the Commission’s approach.² Actually pilots³ run for 25 different product groups like wine, household detergents or thermal insulation materials. The product footprint is intended to be applied in different context, business internally, business to business and business to consumer. The final format of the product footprint is not decided, different examples of communication vehicles have been provided⁴ and will be tested during the pilots.⁵ If the target audience is the final consumer, product footprint might come close to symbols and might be interpreted as a qualitative approach—however this is still an open issue of consideration of the Commission.

Example European “Environmental product footprint” approach.

3.3.3 Material Composition

Addressed Issues Without reference to any ISO standard, business in the supply chain provide information on the composition of their products, especially with regard to the material they consist (UNEP 2014). The objective is to use an agreed data sheet which fulfils information needs of business clients and does not request case-by-case adoption.

² See the webpage http://ec.europa.eu/environment/eussd/smgp/product_footprint.htm (accessed March 6, 2015).

³ See http://ec.europa.eu/environment/eussd/smgp/pef_pilots.ht (accessed 9 March 2015).

⁴ See Mugdal et al. (2012) and a Background Paper (2013).

⁵ See Finkbeiner (2014) for a strong critique of the Commission’s efforts.

Institutional Issues There are no specific institutional prescriptions; however, cooperation between competitors (horizontal cooperation) and clients (vertical cooperation) supports the unification of the data sheets.

Target Groups Mainly business (commercial procurers, public procurers, retailers).

Status The push for the development of material composition sheets is based on requests from clients (commercial or public ones) asking for more information on the products they purchase, e.g. by questionnaires, which ask manufacturers to transmit information about the products/pre-products they sell. Requests and information needs are diverse, often very heterogeneous. Therefore, several branches took the initiative to elaborate unified composition sheets. This is the case in a couple of branches, e.g. electronics industry, car industry. The Consumer Electronics Association (CEA) representing branches from several continents elaborated such a document. Besides industry branches, also global players – focal companies – use their strategic position in the chain to ask their suppliers to deliver information according to unified sheets.

Examples “Material Composition Declaration for Electrotechnical Products” of CEA.

4 Selection of Approaches

In previous research (cf. Rubik and Frankl 2005), we looked for key influencing factors for a successful application of different approaches. Beside general factors like credibility of a scheme and its costs and fees, product group specific factors are the key, see Fig. 6.2. The latter ones could be separated into factors related to environmental challenges, to the market situation, to the relevance of different stakeholders and to the type of approach chosen.

If the product group is the key, which product groups might be distinguished? Rubik and Frankl (2005: 265f.) argues for six categories:

- *Non-recoverable consumable goods*: e.g. tissue papers detergents, soil improvers
- *Recoverable consumable goods*: e.g. copying and printing paper, packaging
- *Energy-consuming durable products with main impact during the use phase*: e.g. cars, IT-equipment, washing machines, refrigerators, dishwashers
- *Energy-passive durable products*: e.g. furniture, textiles, footwear
- *Simple services*: e.g. car washing, laundry services
- *Complex services*: e.g. tourist accommodation

The environmental challenges and impacts of products within these six categories are very different along their life cycle. This means that the consideration of different environmental are not homogeneous, but heterogeneous, also the type and approach preferred as well as the target groups differ. Therefore, Rubik and Frankl (2005: 266ff.) elaborated a guide for the selection of approaches depending on the product category and the target audience. Figure 6.3 shows the proposed allocation

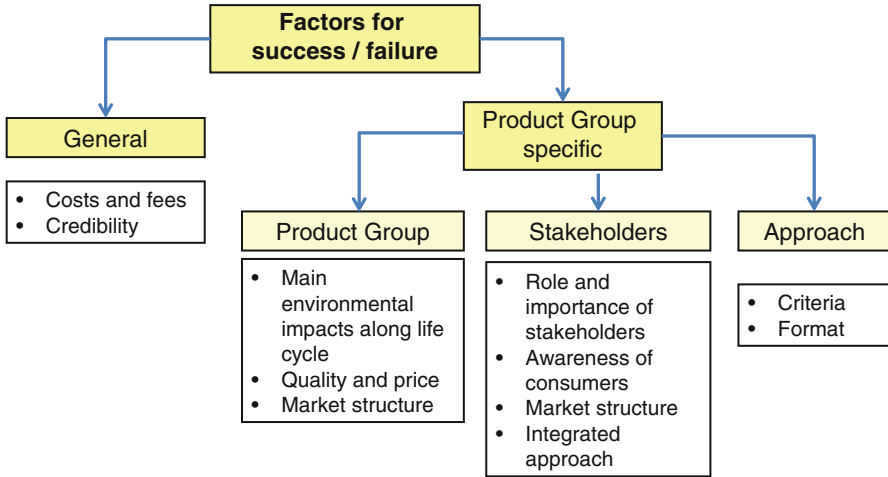


Fig. 6.2 Factors for success or failure of an information transmission approach (Rubik and Frankl 2005: 264; slightly modified)

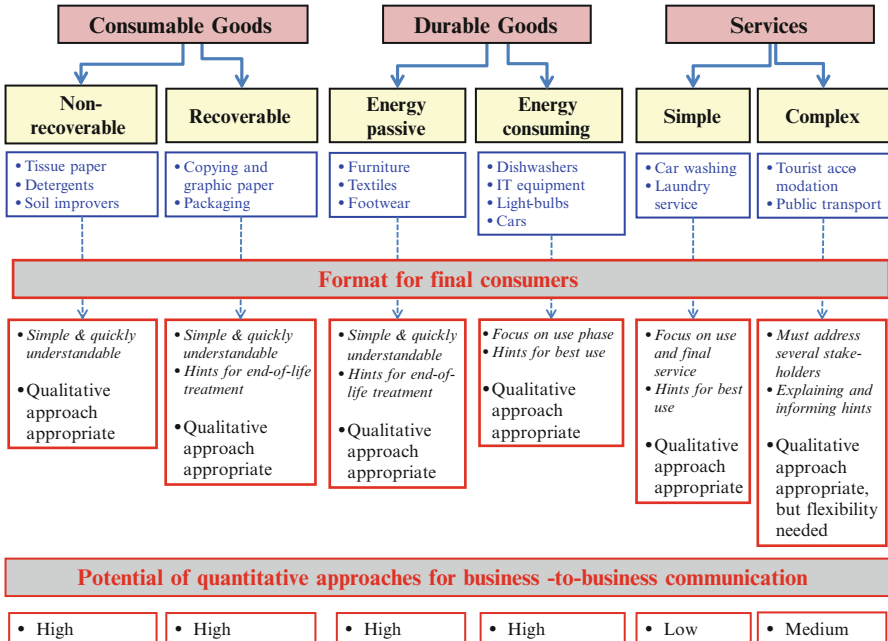


Fig. 6.3 Format of information transmission tools with regard to six product categories (Rubik and Frankl 2005: 273; slightly modified)

of product groups into the six product categories as well as the life cycle phase in which the main environmental impacts occur. It distinguishes among final consumers and business-to-business communication. The latter one is of special interest for LCM-reflections. In general, we rank the potential of qualitative tools in the case of services as restricted. The potential for consumables and durables are assessed as high in the business-to-business communication, although the criteria differ according to the concrete product group and the main environmental challenges along their life-cycles.

However, with regard to final consumers, we judge that qualitative labelling approaches are the main tool to be applied. But the requirements behind the label differs according to the product category, e.g. with regard to energy-passive or energy active durables. Beside the label, also hints for end-of-life treatment are needed to explain consumers an appropriate environmental (more) benign product removal.

5 Conclusions

The proliferation of information as part of LCM is a strong request to support actors downstream with appropriate information. We focused on actors external to the company generating the information (in this case other internal tools are needed).

The tools presented in this section intend to reduce the information seek costs for consumers. However, the target audiences are very different:

- *Private consumers* ask for easy to use and understand information tools, qualitative approaches like the ISO type I approaches (e.g. the EU Flower or the Nordic Swan) are the promising tools which differentiate products within the same product group. Their successful reception by consumers might increase the sale volume of the labelled products and result in reductions of environmental burdens.⁶
- *Business clients* commercial purchasers, public purchasers or retailers – have different information needs, some are requesting quantitative information whereas others need “condensated” information as provided by labels. These different needs require an appropriate strategy of sellers to transmit information towards their clients. The basics are quantitative information based on product category rules agreed and unified within the branch in consensus with the competitors. The information transmitted might support the clients to compare products within the same product group and to prioritise them according to different criteria, among them environmental ones. Depending on the type of product – we proposed six categories – additional quick to understand and easy to recognize information might be needed and in this case qualitative labels play a prominent role.

⁶We hint to the discussion on rebound effects which might have some converse effects (see, e.g., Santarius 2012 or Maxwell et al. 2011).

But beside the sellers and buyers, business and consumers, policy makers are keen to push labels as a prominent tool of environmental and, consumer policy. The example of the European Commission highlights labelling issues in its SCP/SIP Action plan (European Commission 2008) and argues for a broad getting-the-information-right-strategy (European Commission 2013a). The outcome of this process – product environmental footprint – is still early in the pilot phase (PEF 2015). But we might expect an instructive – but controversial – outcome of this process and a ripening of these efforts resulting in an encompassing right to know and duty to inform policy strategy. Therefore, it is up to responsible life cycle management to proactively shape the future.

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