

Measurement Framework of Economic, Ecological and Social Benefits of Eco-Labeling According to the „3-Win” Model of Eco-labelling

© **Rita BARANYI PÉTERNÉ**, © **Piroska HARAZIN**
Budapest University of Technology and Economics, Budapest, Hungary
baranyi@eik.bme.hu, harazin@eik.bme.hu

Eco-labels and eco-labelling (ISO Type I Labels), as one of the important tools of the field of environmental economics and environmental management, are in the centre of our research, our paper. Based on literature review, we introduce the „3-win” model which was improved by one of the authors. The model, in a same time, presents the ecological, economic and social advantages of eco-labelling and introduces the interactions between each field. The model presents that eco-labelling such a tool of environmental management and eco-marketing, which allows reaching the “win-win-win” situation in environmental, social and economic dimensions.

Connecting to the model and by the help of environmental performance evaluation, our aim is presenting a framework, which offer relevant indicator categories for the measurement of ecological, economic and social benefits of eco-labelling. The research based on international and national literature review and focuses on the three pillars of sustainability, namely integrates the economic, ecological and social point of views.

The developed framework (indicator categories) offers a comprehensive picture about the direct and indirect effects of eco-labelling. These effects are influenced by different factors (for example the nature of products, stringency of the criteria system, firm’s specific items etc.), which factors are also explored and introduced in the work. Relative impact of these influencing factors is measured and the result helps us defining the relevant ones.

Results are verified with a help of practice (and a flow chart approach) and an exact example presents the operation of the “3-win” model and also the relevance of the developed framework, which offer relevant indicator categories for the measurement of ecological, economic and social benefits of eco-labelling.

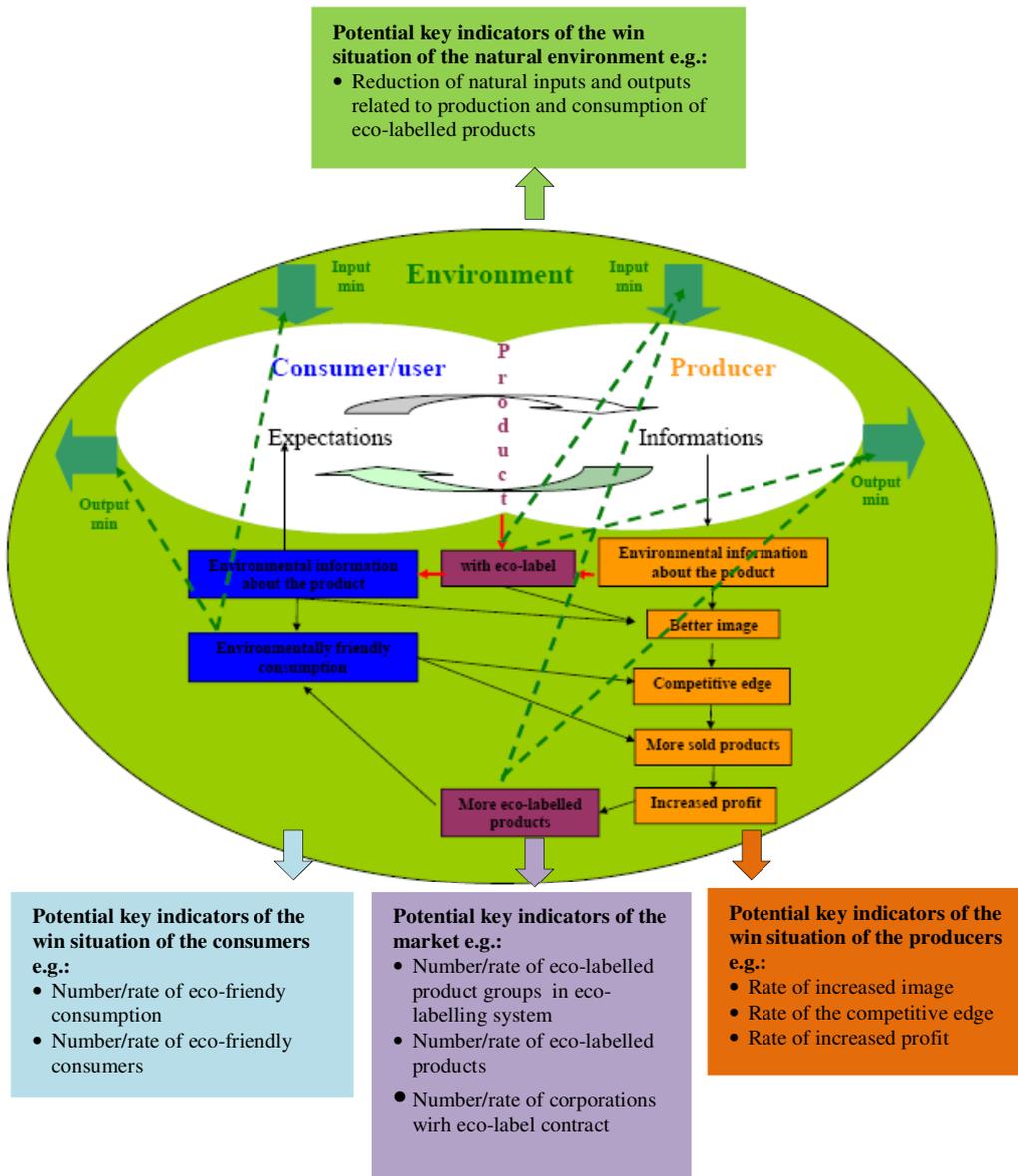
“3win” relationship of eco-labelling

Eco-labelling (ISO I type) is a voluntary environmental policy and management tool. ISO I type environmental labelling provides reliable information on the environmental impacts of a product throughout its life cycle and its eco-friendliness (not in absolute but in relative meaning). Reliability is provided for instance by the system of eco-labelling because it is guaranteed by independent certification. The certification process strengthens the fact that eco-labelling is not a tool of greenwashing (Terrachoice, 2010). Information on the whole life cycle stems from the obligation to comply with the criteria system based on a life cycle perspective.

Eco-labelling is an important environmental policy tool. Eco-labelling appears as parts of international and domestic environmental regulations as a tool that is able to support environmental policy goals as sustainable consumption and production (by informing customers, use of the life-cycle approach, support of environmentally-

friendly products), green procurements, integrated product policy, etc. (Baranyi, 2005a; Sundkvist & Finnveden, 2005). Implementation occurs on the micro level, as part of corporate operation, although its background provided by operating the system at the macro level. Eco-labelling is an important tool of corporate management, which fulfils a special role in corporate environmental communication and eco-marketing. Eco-labels can be used as a tool for realising eco-marketing strategies, indicating a close relationship with its key steps (Rex & Baumann, 2006; Cohen, 2009; Kammerer, 2009; Kotler & Keller, 2006; Baranyi, 2011).

Figure 1: Indicators related to “3win” relationship of eco-labelling



Source: own edition on the basis of Baranyi, 2008

Product eco-labelling is a part of the ISO 14000 family of standards (Type I ISO environmental labelling – ISO Standard No. 14024), which supports the implementation of corporate environmental management. The scientific background of eco-labelling is derived from life-cycle analysis, another essential environmental management tool (Tóthné, 2008; Herczeg & Baranyi, 2005).

Furthermore, eco-labelling is a tool that is able to establish a “3win” (win-win-win) relation system between the three dimensions of sustainability, providing benefits for the economy (organisations allowed to use eco-labels), society (buyers, consumers) and the natural environment. The realisation of these theoretical benefits in practice is tied to requirements that need to be met simultaneously to achieve efficient system operation.

The basic of the “3win” model is the three dimensions of sustainability. The eco-labelled product makes contacts between the economy and society, between the producer and consumers. Consumers have expectations related to products and operation of corporations. Corporation’s own interest is to satisfy the stakeholder’ requirements (KÓSI et al., 2008). Eco-label is a tool that can be used successfully as part of corporate environmental communication (Erlandsson & Tillmann, 2009). Producers have the possibility to take part in an eco-labelling process (ISO I type eco-label is a voluntary tool) and win the label. The main stakeholders of the process are the producer as applicant and the eco-labelling organization. If the product fulfils the LCA based requirements of the product criteria system, the producer can use the label that can ensure a win situation to the corporation. However other “wins” also appear in the whole system.

Win situation for the producer

In the background of the win situation of the producer there are better image, competitive edge and increased profit on the market of the product that stems of eco-labelled product.

Win situation to the consumer

Win situation to the consumer means that the consumers get information with the help of eco-label about products therefore they can choose eco-friendly product which is a positive driving force of environmentally friendly consumption.

Win situation to the natural environment

Win situation to the natural environment originates from the reduction of the usage of natural resources and emissions which are related to the production and the consumption processes. This reduction is guaranteed by eco-label criteria systems that include environmental criteria in all the life cycle stages of the product.

Measurement of advantages of eco-labelling – indicators

The before mentioned model presented the advantages, benefits of eco-labelling, according to the three pillars of sustainable development. However, to the "3win" situation prevails in the practice, it is needed that the advantages, benefits will be visible and understandable for stakeholders too. In order to the before mentioned, theoretical modeling of "3win" situation is not just enough, measurement and presentation of impacts (for the stakeholders) is also needed.

Methods of indicators can be a useful tool in the measurement of the social-economic-environmental advantages of eco-labelling, because different sets of indicators allow the monitoring and measurement of the social-economic-environmental changes in micro- and also macroeconomic levels.

Given the fact that producers and also consumers are motivated by the knowledge of the presented advantages in the model, in this paper we discuss only the measurement, evaluation of the mostly motivating factors, namely:

- What is a better environmental impact of eco-labeled products (than the other products' which fulfill the same function) and how is it guaranteed? – Assuming that the consumer may be motivated in decision about environmentally friendly products by the surrounding environmental information.
- What is the benefit of the producer, derived from eco-labelling? – Assuming that the producer is motivated in the participation of eco-labelling by the potential benefits.

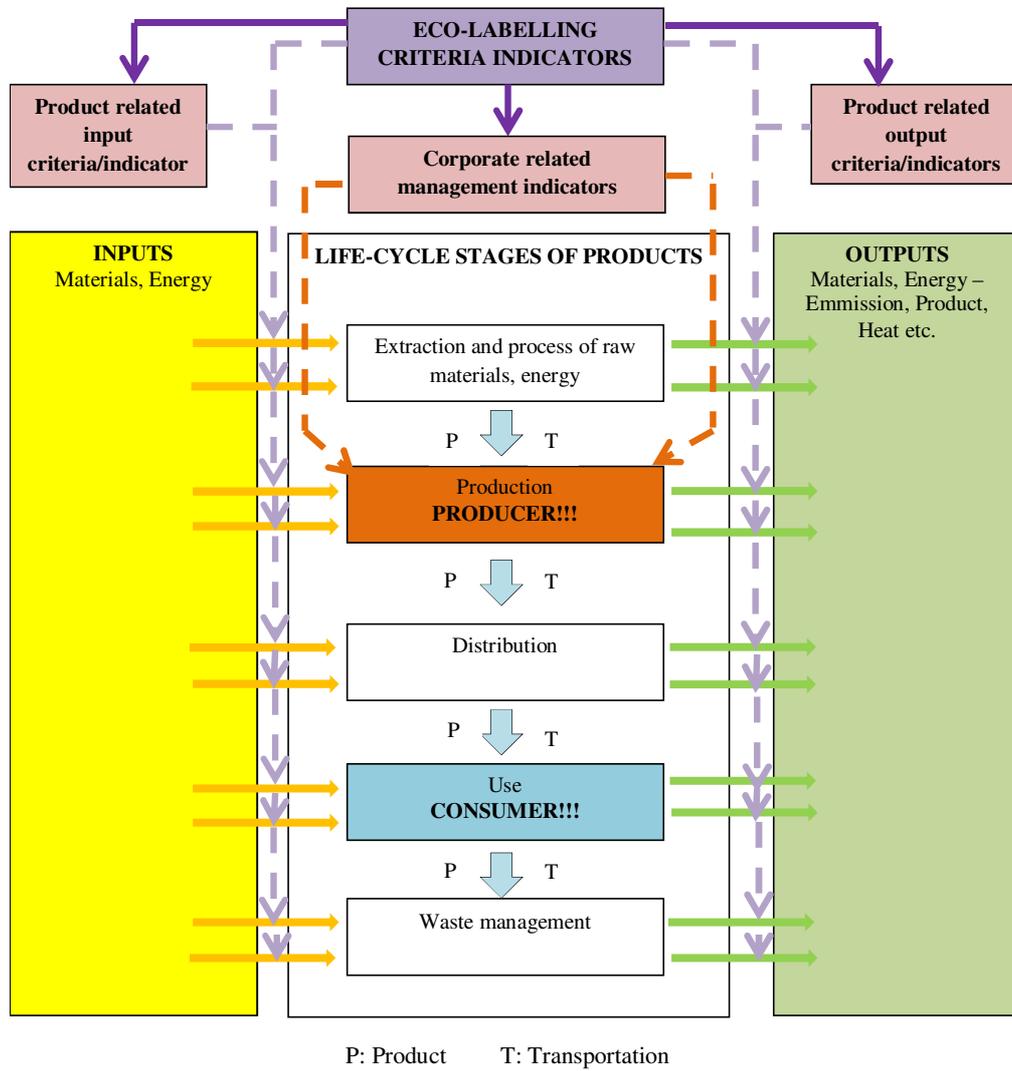
Indicators of environmental impacts of eco-labelled products

There is life-cycle analysis in the scientific background of eco-labelling. Eco-labelling organizations work out a criteria system with requirements related to the life-cycle stages in case of each product-groups. In criteria systems these requirements are reviewed by indicators. These indicators are not only confined to the product related information but also to corporate related management information (Baranyi, 2005).

Criteria indicators can be grouped as (KÓSI et al., 2008):

- Product/management related indicators,
- Input/output indicators,
- Quantitative/qualitative indicators,
- Absolute, relative, normalized, aggregated etc. indicators,
- Indicators related to extraction and process of raw materials, production, transport, distribution, use, reuse, recovery and disposal of products.

Figure 1: Eco-labelling criteria indicators



Source: own edition

In the following table (Table 1) there is an analysis of criteria indicators. In the first column there are some examples of indicators which are originated from the EU's criteria system of tissue paper (EU eco-labelling homepage). The second column contains the type of the chosen indicators (which is our classification according to the before mentioned groups of criteria indicators).

Table 1: Examples of indicators from the EU's criteria system of tissue paper product group

<i>Examples of indicators from the EU criteria system of tissue paper product group</i>	
Criteria/indicator	Type of indicator
Emissions to air and/or water from the pulp and the paper production shall be expressed in terms of points (P_{COD} , P_{P} , P_{S} , P_{NOX}) as detailed below: None of the individual points shall exceed 1,5	Product related, quantitative, relative, output indicators in connection with the production life-cycle stage
The total consumption of electricity related to the tissue-paper product shall be calculated as the sum of the electricity used in the pulp and the tissue paper production stages and shall not exceed 2 200 kWh electricity per ADT of paper produced.	Product related, quantitative, relative, normalized input indicators in connection with the production life-cycle stage
The fibre raw material in the paper may be recycled or virgin fibre. 50 % of any virgin fibre must, however, originate from sustainably managed forests which have been certified by independent third party schemes...	Product related, quantitative, relative, input indicators in connection with the raw materials and production life-cycle stage
All producers of pulp, paper and converted tissue products shall have a system for the handling of waste and residual products arising from the production plants. The system shall be documented or explained in the application and shall include at least the following points: procedures for separating and recycling materials from the waste stream; procedures for recovering materials for other uses, such as incineration for raising process steam, or agricultural use; procedures for the handling of hazardous waste.	Management related (documentation), qualitative indicators
Box 2 of the Eco-label shall include the following text: uses sustainable fibre, low water and air pollution, low greenhouse gas emissions and electricity use.	Management related (communication), qualitative indicator
Next to the Eco-label, the manufacturer shall either provide a statement indicating the minimum percentage of recycled fibres, and/or a statement indicating the percentage of certified fibres.	Management related (communication), qualitative indicator (but the percentage of recycled fibres or certified fibres are product related relative indicators in connection with the raw material and/or waste management life-cycle stage)

Source: own analysis and edition based on the EU criteria system of tissue paper – <http://ec.europa.eu/environment/ecolabel>

There are different types of criteria indicators in the criteria systems, as table 1 shows it. The aim of these criteria is to reduce the input and output impacts in the whole product life-cycle process. These criteria can be useful in the communication of eco-labelling organizations and corporations, as well in the motivation of eco-friendly consumption of consumers. Eco-labelling organizations use not exactly the mentioned indicators but the essence of these. For example in the analysed product

criteria system (EU – tissue paper) the used sentences on the homepage for example can be the following ones:

“The EU Ecolabel logo on Tissue paper tells you:

- *Reduced air emissions of sulphur and greenhouse gases during production*
- *Decreased water pollution during production by reducing the emissions of chlorine compounds and organic waste*
- *Reduced energy consumption during production*
- *Use of recycled fibres or virgin fibres from sustainably managed forests*
- *Limited emissions of sulphur oxides, phosphorus, nitrogen oxides and carbon dioxide to air etc.”* (EU eco-labelling homepage)

Criteria systems have the aim to reduce the environmental impacts of products but our opinion is that the used indicators of the criteria systems themselves are not able to measure the real reduction related to the product. Measurement of the reduced environmental impact of a real eco-labelled product can be possible in micro level by corporations with the help of LCA based criteria system, environmental performance evaluation and other management methods.

Measurement of impact, benefits in case of the producer

The second motivating factor, which is presented in this paper, is in connection with the benefits of eco-labelling in case of the producer, namely: What is the benefit for the producer, derived from eco-labelling? It can be claimed, that ecological, economic and social impacts of eco-labelling can be interpreted in microeconomic level too, namely in corporate level. It is important to analyse this level, because the role of producer is emphasised in the whole system, it can be a fact that the whole system is depending on them: if they understand the advantages of eco-labelling, they will apply and use eco-labels. Advantages, benefits, impacts of this process must be visible for them, because we assume that they are motivated in the participation by the potential benefits, advantages of eco-labelling. However, as was it discussed before, it is needed that the advantages, benefits will be visible and understandable for stakeholders, in this case for producers, so finally the measurement and presentation of impacts and also benefits, advantages is also needed.

Our opinion is that the system of economic, environmental and social impacts and also the benefits, advantages of eco-labelling is complex; therefore approach of the measurement and the evaluation also will be/should be complex and compound. Based on the chapters and especially the examples mentioned before, in this paper we concentrate on environmental impacts and benefits, advantages of eco-labelling, and the frame of measurement, evaluation of these in the level of producer. Analysing the LCA based criteria system we conclude that it can be the base of this measurement, evaluation and can ensure indicators also in micro level, in the level of producer. We claim that these criteria as indicators can be integrated into the environmental performance evaluation (EPE), which is *“an internal process and management tool designed to provide management with reliable and verifiable information on an ongoing basis to determine whether an organization’s environmental performance is meeting the criteria set by the management of the organization”* (ISO 14031 cited by Jasch, 2000:79), (MSZ EN ISO 14031, 2001) In this case the criteria set of EPE contains the requirements of the process of eco-labelling, which are form the LCA based criteria system and concern to the producer.

There are literatures (e.g. Tóth, 2002) about different types of tools and methods of EPE, for example Epstein and Roy claim that “*(d)ifferent types of tools and techniques can be used to measure potential social and environmental impacts of a company’s business activities*” (Epstein & Roy 2001:590), in addition Singh et al. (2009:191) emphasise that “*(t)here are number of frameworks of sustainability assessment that evaluate the performance of companies.*” Between the tools and methods of EPE we can conclude (lots of literatures deal with environmental indicators (inter alia Jasch, 2000; Singh et al., 2009; Tóth, 2002; Kósi & Baranyi 2007), that there is an emphasised role of the method of environmental indicators, however it is important to mention that different difficulties in connection with the indicator method also appear in the literature (Inter alia, for example Seuring et al. (2008, p. 1648) express that “*(i)t seems unlikely that there exists one single set of indicators that may cover all the aspects of all companies’ functions, especially when they are defined in order to deal with sustainability issues.*”).

During the EPE of eco-labelled producer corporation, the criteria and also the indicators of evaluation can be the requirements and indicators of eco-labelling’s LCA based criteria system which concerns to the producer. These can be also input and output side requirements and indicators as it is presented in Figure 2 (orange-coloured box of producer in the whole system). We can conclude that these are in connection with the offer of ISO 14031, which suggests the use of operational input and output environmental indicators (OPIs), during the EPE (MSZ EN ISO 14031, 2001; Kósi et al., 2008). It is important to mention the potential presence of management performance (MPI) and environmental condition indicators (ECI), which are also offered by ISO 14031 and also characterize the environmental performance (MSZ EN ISO 14031, 2001; Kósi et al., 2008). Using these other types of indicators, the evaluation of environmental impacts and benefits, advantages of eco-labelling in the level of producer can be improved. However, by the use of other management tools this process also can be strengthened and improved.

Based on previous researches and experiences we suggest the integrated use of different performance evaluating and management methods (e.g. environmental management accounting (EMA; about EMA see more in e.g. Jasch, 2003), Sustainability Balanced Scorecard (SBSC; about BSC see more in (Kaplan & Norton, 2000); about SBSC see more in e.g. Figge et al., 2002) for a complex and improved evaluation (visualization and evaluation of physical and monetary impacts and benefits, advantages). This improved, integrated approach can be useful in general to measure, evaluate environmental, sustainability performance of a corporation (e.g. Harazin & Kósi, 2011; Harazin & Kósi 2013), however it can be used also in case of eco-labelling, but also in economic, social and environmental point of view, to measure social, environmental and economic impacts and benefits, advantages of eco-labelling in case of a producer.

Conclusions

The "3win" model of eco-labelling discusses the environmental, social and economic benefits, advantages of eco-labelling in theory however these advantages can be measured by indicators in practice. Key indicators of impacts and benefits, advantages are presented in this paper. In this paper we concentrated to the measurement of environmental impacts of eco-labelled products. Criteria systems have the aim to reduce the environmental impacts of products but our opinion is that the used indicators of the criteria systems themselves are not able to measure the real

reduction related to a product. Measurement of the reduced environmental impact of a real eco-labelled product can be possible in micro level by corporations and we presented the frame of this measurement and mentioned the integrated approach of LCA based criteria system, environmental performance evaluation and additional performance evaluating, management tools.

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