

Methodology of ecological criteria development for products under ecolabelling program of type I

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Abstract The report provides general description of ecolabelling program in Ukraine, its history and results for the period of existence since 2003. Basic stages of ecological certification under ecolabelling program of type I are described. The methodology of ecological criteria development for products and services life cycle assessment is demonstrated. General principles and characteristic features for Ukraine are described. Special attention is paid to subjects, which are involved to the process of ecological criteria development, reviewing and approval. To clearly demonstrate particular stages of ecological criteria development (selection of main environmental aspects of given product category and their impact on natural environment and establishing qualitative and quantitative requirements for products) the example of criteria development for mattresses is provided.

1 General information about ecolabelling program in Ukraine

In Ukraine ecolabelling program is implemented since 2003 on the initiative of All-Ukrainian non-governmental organization "Living Planet" with the assistance of the Committee of Verkhovna Rada (Parliament) of Ukraine on Ecological Policy and Ministry of Environment and Natural Resources of Ukraine.

Taking into account the mission of sustainable development and consumption, which is stated in the Statute of our organization, the decision was made to implement an ecolabelling program of type I according to the requirements of international standard ISO 14024. The ecolabelling scheme was developed and ecolabelling body was founded taking into account best practices of other ecolabelling programs, such as programs of the European Union, Germany, U.S., Nordic countries and others.

Ecolabelling body was notified in 2003.

In 2004 our organization has been accepted to the members of Global Ecolabelling Network.

In 2005 ecolabelling body has been accredited in the System of Independent Certification in accordance with the requirements of standards DSTU EN 45011-2001. The same year the subcommittee "Life cycle assessment" was created in the composition of National Technical Committee of Standardization "Natural Environmental Protection of Ukraine" (TC 82). Since 2005 this subcommittee is the base for ecological criteria development.

Since 2007 our organization is an associate member of the International Federation of Organic Agriculture Movements (IFOAM).

In 2010 ecolabelling was accredited by the National Accreditation Agency of Ukraine in accordance with the requirements of standards DSTU EN 45011-2001.

2 Ecolabelling of type I

The overall goal of ecolabelling is by transferring validated, accurate and truthful information on the environmental aspects of products and services to promote increasing of demand and supply of these products and services, which provide less load on natural environment, thereby stimulating the potential for market caused permanent improvement of environmental performance [1].

The task of ecolabelling program is promotion of environmental impacts reduction, associated with the products, through identifying products that meet specific criteria for ecolabelling programs for the overall environmental benefits [1].

The process of ecolabelling is divided into three stages (Fig.1):

1. Selection of a new product category for ecological criteria development.
2. Ecological certification and the right to use ecolabel.
3. Surveillance of certified products.

Within the framework of ecolabelling program special attention is paid to methodology of ecological criteria development and implementation. These criteria are the basis for environmental performance assessment of products at all stages of life cycle.

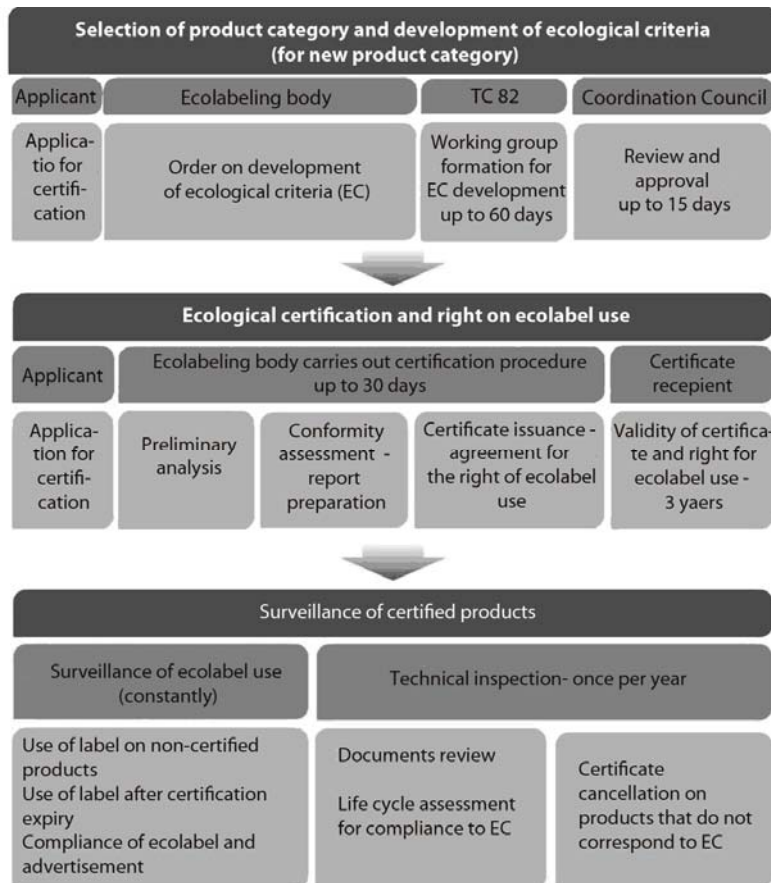


Fig.1: Basic stages and subjects of ecological certification

Ecological criteria exactly define measurable characteristic differences between conventional and ecologically labelled products.

3 Ecological criteria. General principles and features of development and implementation in Ukraine

Ecological criteria are ecological requirements for certain product category, which the product must comply at all stages of life cycle to get the right of ecolabel use [1].

The basic principle of the ecological criteria development is consideration of the entire life cycle for the selected product categories to identify the most significant ecological aspects that demonstrate its impact on the environment.

Experience shows that at each stage of product life cycle there is a potential to reduce resources consumption and improve environmental performance, e.g. as shown in Table 1.

Tab.1: Ways of reducing consumption and improving environmental performance at different stages of product life cycle

Stages of life cycle	Ways of resources consumption reduction and environmental performance improving	Example
During whole life cycle	Reduction of emissions, discharges and solid wastes production; Reduction of energy, water and materials consumption	Closed cycle of water use; Use of alternative energy sources
Product design, process planning and development	Rethinking products design and functions	Product can be used effectively
Production and maintenance	Maintainability of the product; Replacement of hazardous substances, included to the product composition, by safer analogues	Use of modules that can be easily replaced
Packaging	Reuse and recycling	Selection of materials for products manufacturing and packaging, which undergo recycling and reuse
Storage, trade and distribution	Transportation by wholesale quantities and by optimized routes	Procurement of raw materials in production areas for minimizing air emissions during transportation on long distances

Installation and debugging, support and service	Maintainability of the product	Use of modules that can be easily replaced; Appropriate guidance
Disposal and recycling	Multiple use	Product design, providing replaceable and reusable parts

Ecological criteria have to meet the following requirements:

- a) take into consideration the net environmental balance between the environmental benefits and burdens, including health and safety aspects; where appropriate, social and ethical aspects shall be considered, e.g. by making reference to related international conventions and agreements;
- b) be based on the best products in terms of environmental performance throughout the life cycle, and they shall correspond indicatively to the best 10-20 % of the products available on the market of Ukraine;
- c) be based on the most significant environmental impacts of the product, be expressed as far as reasonably possible via technical key environmental performance indicators of the product;
- e) be based on sound data and information which are representative as far as possible;
- e) be set within reasonably achievable limits, taking into account availability and accuracy of their evaluation;
- g) take into consideration the views of all interested parties involved in the consultation;
- g) guarantee harmonization with existing legislation applicable to the product group when considering definitions, test methods and technical and administrative documentation;
- c) take into account relevant state environmental policy and policy of correspondent industry branch (that includes given product category) development and already developed ecological criteria for relevant product categories.

During development of ecological criteria both qualitative and quantitative indicators should be used to limit environmental impacts. Quantitative values should be given as minimum values, maximum allowed levels, coordinate system or in another appropriate manner. The main environmental aspects are determined by filling in Table 2 that determines the basic materials and energy flows and their impact on all components of environment.

Tab.2: Matrix of selection of typical criteria for environmental products [1]

Stages of life cycle	Ecological indices of inputs/outputs					
	Energy	Resources	Pollution of			Other
	Renewable/non-renewable	Renewable/non-renewable	Water	Air	Soil	
Resources extraction						
Production						
Distribution						
Use						
Disposal						

All such indicators have to have references to regulations and are developed so as to minimize the negative impact of production.

Ecological criteria include both obligatory and optional requirements. Optional requirements are advisory, while compliance with obligatory requirements is the evidence of products environmental improved performance. For example, during assessment of the food category group requirements for raw materials are determined according to requirements of organic agriculture [2,3]. But such requirements can not be achieved by 10-20% of Ukrainian producers. That's why, if set, they are considered as non-obligatory, but optional. Such products can not get the label of organic products, but can get a license for use of ecolabel if they comply to ecological criteria.

A common practice is to develop ecological criteria through harmonization of already existing criteria within other ecolabelling programs. Application of given approach involves determination of quantitative and qualitative indices that would meet the requirements of national legislation and are available for Ukrainian producers.

The main stages of ecological criteria development and involved subjects are shown in Fig. 2.

Ecological criteria are developed on the base of SC 2 "Product life cycle assessment" of TC 82 "Natural Environment Protection". Subcommittee SC 2 TC 82 is an active member (P-Member) of subcommittee SC 3 "Environmental labeling" and SC 5 "Life cycle assessment" of ISO/TC 207.

SC 2 TC 82 comprises 23 scientific, expert and public organizations. During formation of working group for ecological criteria development, depending on the selected product categories representatives of other relevant TCs or interested parties may be involved.

The draft of ecological criteria is sent for review and approval to expert organizations. After follow-on revisions the draft project is committed to the Coordinating Council of ecolabelling body.

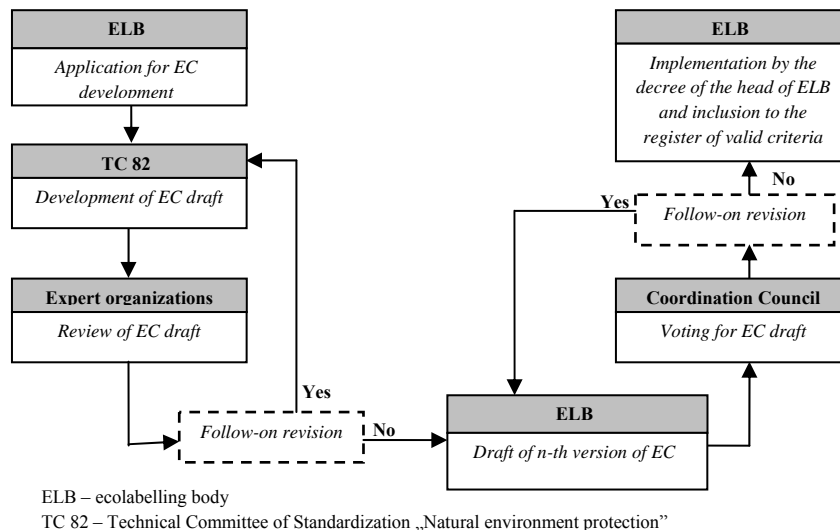


Fig.2: A scheme of development and approval of ecological criteria

Coordinating Council is an independent body, the purpose of which is to ensure the impartiality of ecolabelling body actions, enabling the participation of all interested parties in developing policy related to the content and principles of environmental labeling in accordance with the requirements of ISO 14024.

To ensure transparency composition of the Coordinating Council set quotas to structure: one third of total member number should be representatives of executive authority, one third – representatives of independent expert organizations, one third - representatives of non-governmental organizations.

Information access, discussion and comments on the draft of ecological criteria is done in on-line mode. The draft of criteria is submitted to the open vote session of the Coordinating Council. After approval of the project, ecological criteria are implemented to the ecolabeling program.

4 Development of ecological criteria on the example of mattresses

Mattresses are very important products in everyday life. They are in direct contact with the human body during sleep and are an integral part of any dwelling.

When developing ecological criteria for mattresses we must first of all set limits of life cycle assessment, taking into account the most significant environmental aspects for products in this category. With this purpose analysis of main stages of life cycle is carried out by considering each component as shown in Fig. 3-4.

Further we are considering the possibility of setting limits on environmental impacts, taking into account that these restrictions should be available not more than for 20% of Ukrainian producers.

For given products category the most significant environmental aspects should be considered such as quality of raw material, which is part of the final product, production process and its impact on the environment.

Therefore during development of ecological criteria the following requirements were established:

1. Requirements for raw materials (materials for mattress production: latex foam, polyurethane foam, wire and springs, coconut fiber, wood products, textiles (fibers and fabrics), glues): restricted heavy metals, formaldehyde, chlorophenol; not allowed to use metal complex dyes based on copper, lead, chromium, nickel, tin in organic form, CFC, HCFC, HFC, methyl chloride, benzene and chlorinated solvents.

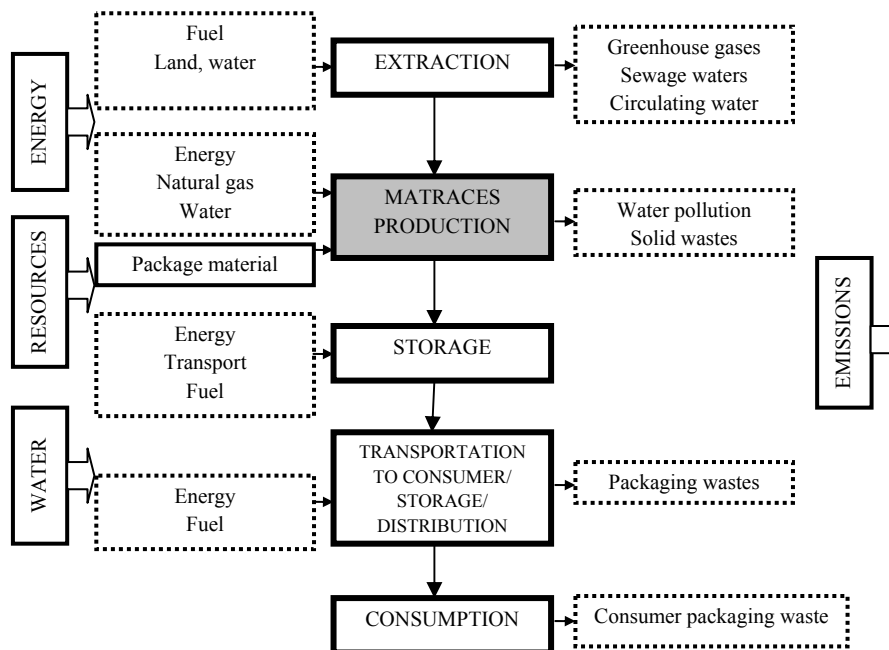


Fig.3: Scheme of product life cycle assessment to establish the most significant environmental aspect for mattresses

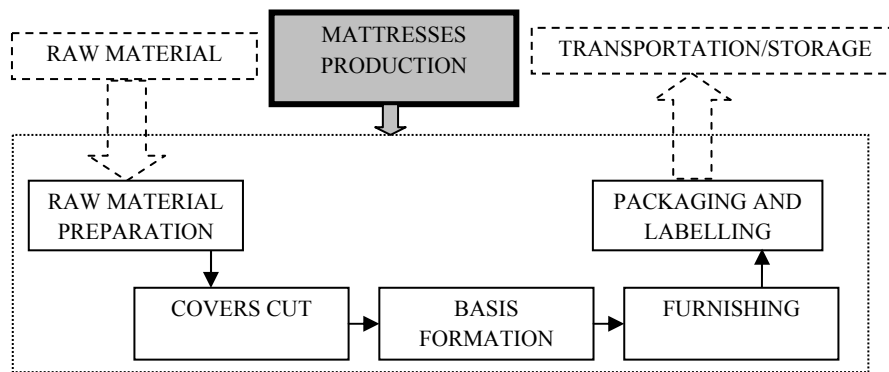


Fig.4: Scheme of mattresses production

2. Requirements for production:

- 2.1 Requirements for polluting materials (should demonstrate at least 10% reduction of the limits set by regulations).
- 2.2 Requirements for maximum allowable levels of energy consumption (based on best national practices)
- 2.3 Requirements for maximum allowable levels of thermal energy consumption (based on best national practices)
- 2.4 Requirements for maximum allowable levels of water consumption (based on best national practices)

3. Requirements for packaging:

- 3.1 Suitability of packaging materials for reuse
- 3.2 Suitability of packaging materials for recycling
- 3.3 Absence of cover, which prevents recycling
- 3.4 Absence of chlorinated materials in the composition of the packaging materials

4. Requirements for labeling

- 4.1 Availability of information for consumers about recycling of waste products
- 4.2 Absence of labeling, misleading consumers

5. Requirements for transportation and storage

- 5.1 Availability of optimized scheme of products transportation
- 5.2 Transporting of products in wholesale best quantities

6. Requirements for reprocessing and recycling

- 6.1 Absence of any protection materials (fungicides, insecticides, flame-retardant materials), halogen organic compounds (organochlorine compounds in textiles).

7. Requirements for finished products

- 7.1 Restrictions on the maximum permissible concentration of volatile chemicals (ammonia, Butyl acetate, vinyl acetate, hexamethylenediamine, dibutylphthalate,

dioctylphthalate, xylenes, methanol, styrene, toluene, toluene diisocyanate, formaldehyde, phenol, phthalic anhydride, ethyl acetate, ethyl benzene), which are emitted during use of these products indoors, loss of thickness, loss of elasticity.

Ecological criteria for mattresses were developed through harmonization of existing standards in other ecolabelling programs. During development ecological criteria of the following programs were used: Taiwan's Green Mark Program for Mattresses, Ecological Criteria of EU Eco-Label to Bed Mattresses and Basic Criteria for Mattresses RAL-UZ 119 (Blue Angel).

The final assessment of products conformity to requirements of ecological criteria is done by filling in a check-list. The check-list clearly and understandably displays all major quantitative and qualitative characteristics, compliance to which must demonstrate products to get an ecolabel.

References

- [1] DSTU ISO 14024:2002 environmental labeling and declaration. Environmental labeling of type 1. Principles and methods.
- [2] EU Regulation № 834/2007 "On ecologically clean agriculture and appropriate designation of agricultural and food products".
- [3] IFOAM Basic Standards for Organic Production and Processing, Version 2005, Published in Germany by IFOAM, 2007.