GENERAL PRINCIPLES FOR AN ENVIRONMENTAL COMMUNICATION ON MASS MARKET PRODUCTS

METHODOLOGY FOR THE ENVIRONMENTAL IMPACTS ASSESSMENT OF BADMINTON SHUTTLECOCKS

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ADEME

Agence de l'Environnement et de la Maîtrise de l'Energie

READING GUIDE

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INTRODUCTION

Background

General background on environmental labelling

Article 54 of law No. 2009-967 passed on 3 August 2009 states that consumers shall be given objective environmental information on product characteristics (environmental impacts of the product/packaging pair).
Environmental labelling applies to all consumer products targeted at the end-consumer. Since spring 2008, AFNOR has been conducting work headed by ADEME to develop the methodologies assessing environmental impacts with the involvement of all stakeholders: professionals, but also based on input from civil society. **The AFNOR repository of best practices BP X30-323 is the framework document that sets out the general principles** so that companies who wish to initiate environmental labelling can do so on the basis of a common methodology. The repository has established that the indicators should allow products belonging to the same category to be compared. It is therefore necessary for the indicators to be calculated in the same manner. For this reason, and as an extension of this repository, work groups have met to specify calculation methods.
Sector-specific work groups bring together professionals and other stakeholders concerned by a product family to discuss and propose calculation methodologies specific to a given product.

Specific background of the reading guide: work on badminton shuttlecocks

This repository deals specifically with badminton shuttlecocks used to play sports on courts.

Environmental labelling principles

In order to provide consumers information that is representative of the main environmental impacts of products, the environmental labelling system is based on a key method for all work in the area: **life-cycle analysis** (LCA). This assessment makes it possible to identify and evaluate all the potential environmental impacts of a product at each stage of its life cycle: raw materials production or extraction, product manufacture, distribution, product use and the impacts associated with its end-of-life processing or disposal.
ISO 14040 and ISO 14044 [1] provide an international framework for this type of assessment. The standards have, however, left various methodological options open. The purpose of the cross-sector methodology annex and the sector-specific methodology annexes is to further specify these methodologies in order to ensure that **all calculations follow the same method and that the results included in the environmental labelling system are therefore comparable.**

Objective of the reading guide

The aim of this reading guide is to explain some of the concepts and requirements included in the repository of badminton shuttlecocks and make them accessible to a wider audience so that everyone can understand the choices made in the repository.
There is also a reading guide for the cross-sector methodology annex that is applicable to all products.

[1] www.iso.org

PRESENTATION OF THE PRODUCT COVERED BY THE REPOSITORY

Introduction

The work group on Sport Equipments, jointly led by the Fédération Professionnelle des entreprises du Sport & des loisirs (FPS-professional federation for sports and firms) and ADEME, met on a regular basis from January 2009.

Works on badminton shuttlecocks began in February 2011 and culminated in a repository in February 2012. These works regrouped a producer (Babolat), federations (FIFAS and FPS), Intertek-RDC and ADEME.

This repository deals specifically with badminton shuttlecocks used to play sports on courts. It therefore excludes shuttlecocks categorized as "toys".

Functional unit

Determining the functional unit and the reference flow

Functional unit

The functional unit is the unit of measurement used to evaluate the service provided by the product. The functional unit of the "badminton shuttlecocks" category is the following:

"Use of a badminton shuttlecock to play sports non-professionally (for leisure or in competitions)".

The functional unit does not refer to the concept of lifespan, as there is no agreed upon, shared or standardized method for evaluating it.

Reference flow

The reference flow designates the quantity of product necessary to satisfy the needs defined by the functional unit. The environmental impacts are expressed in terms of the functional unit on the basis of the reference flow, which is defined as one shuttlecock and its packaging system (per shuttlecock).

Principal components of a shuttlecock

The shuttlecock is composed of a tip and a cone, which can be made of various components depending of their design:

- **The tip:** EVA plastic, cork, rubber, synthetic leather
- **The cone:** nylon, goose and duck feathers, cotton yarn, glue

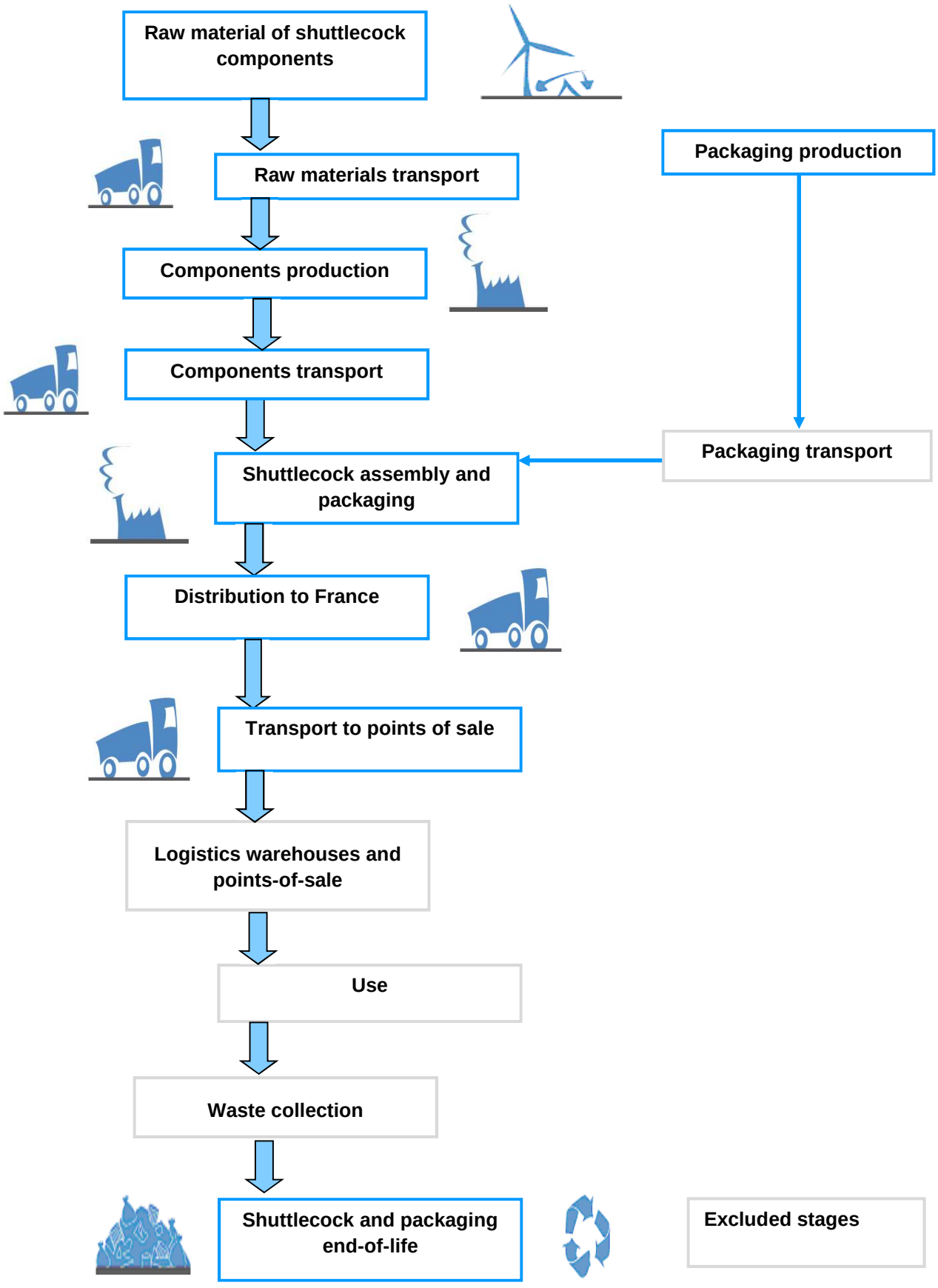
Tennis ball are most often pressurized (air injection) and packaged into boxes themselves under pressure.

Shuttlecock life cycle and study scope

All the stages of the life cycle are taken into account. The only stages that are not counted are those:

- With **negligible impact** on the environmental balance of the seat:
  - The manufacture of minor shuttlecock components, which together come to a cumulative weight of less than 5 % by mass
  - Production and end-of-life of tertiary packaging
  - Forming primary and secondary packaging material
  - The use phase
  - Transport of packaging to the production site
  - Activities at logistics platforms and points-of-sale.
  - Transport involved in collecting household waste
  - The construction of industrial site buildings and the manufacture of site machinery and production tools
- That are **excluded by the methodological repository BP X30-323**: customer journeys between their home and the point-of-sale are not directly included in indicators.

Shuttlecock life circle



EXPLANATION OF METHODOLOGICAL CHOICES

Environmental issues and impacts

Environmental impact assessment

Some criteria have been identified as significant for the overall environmental balance of the shuttlecocks:

Greenhouse effect

Manufacturing and assembly activities of the cone, distribution and scrap end-of-life generate greenhouse gas emissions that drive climate change. **The Grenelle 2 laws and the requirements of BP X30-323 have made it mandatory to consider this issue.**

Depletion of fossil-fuel resources

Manufacturing and assembly activities, distribution, tip production and packaging require important use of non-renewable resources. **The tip makes strong distinctions for a majority of products on the market, according choices on materials. Therefore this indicator was aggregated and adopted for the assessment and the communication.**

Eutrophication

Eutrophication is the modification and deterioration of an aquatic environment by inputs of phosphate nutrients for marine water eutrophication and azote nutrients for fresh water eutrophication. It can generate an excessive and rapid development of micro-algae and could lead to a lack of oxygen in the deep waters.
Manufacturing and assembly of the tip and the cone, packaging production, distribution and scrap end-of-life contribute significantly to these nutrient inputs. **The fresh water eutrophication is particularly differentiating for the assembly phase. Therefore this indicator was retained for the assessment and the communication, whereas the marine water eutrophication was only retained for the assessment.**

Air acidification

Some gases (e.g. sulphur dioxide and nitrogen dioxide) released into the air by production phase (feathers), assembly and distribution activities become acids when they come in contact with humidity. These acids then fall back to the ground during rainfall events and modify the pH of rivers, lakes and soil. **This indicator was only retained for the assessment but not for the communication.**

The choice of environmental indicators for the environmental labeling was made on several criteria:

- indicator relevance: importance of the impact and differentiation for a majority of market products (comparability)
- indicator ease of implementation: feasibility for the database and accessibility of the data for the firm
- indicator consistency: coverage of the whole life cycle scope and product packaging scope, consistency with other posted indicators
- indicator robustness and reliability: methodological recognition and robustness, reliable data.

Indicators retained for the environmental communication:

- **Climate change**, expressed in kg CO_2 eq.
- **Depletion of mineral and fossil-fuel resources**, expressed in $10e^{-5}$ person-reserves
- **Fresh water eutrophication,** expressed in g P eq.

(See the Unit glossary)

Data underlying impacts and articulation of specific and generic data

Type of data used for labeling

The work group shall specify which parts of the quantified data shall necessarily be specific data and which can or shall be generic data.

The data qualification depends on:

- the relative importance of this data for the overall balance,
- the availability of the data,
- the cost involved in obtaining the data

Data used to calculate impacts:

Activity data: data relating to the activity

- **Specific data**: data measured or calculated by the company. Example: nature and quantity of the packaging material.
- **Generic data**: averaged data used by all companies of a specific sector. Example: loss rate of a specific process.
- **Semi-specific data**: data that is proposed by default and that the company can replace with primary data.

Inventory generic data sets: data available in the ADEME database. Example: impact factors of a material

The following table summarizes the choices made for ball modelling:

Phase	Activity data			Inventory generic data sets
	Specific data	**Semi-specific data**	**Generic data**	
Raw materials	- Total shuttlecock mass - Composition of main shuttlecock components - Characteristics of primary packaging	- Composition of low-weight materials		- Impact factors of raw material and shuttlecock packaging
Manufacture	- Shuttlecock manufacturing country - End-of-life scenario for feather scraps	- Energy use for assembly - Products used at the production and assembly phases - Spoilage at production		- Impact factors of component shaping process - Impact factors of electricity and heat power production
Transport	- Transport to France - Number of transport vessels necessary (shuttlecock and secondary packaging volume/available volume of the mode of transport)	- Transport scenario for the shuttlecock raw material - Distribution within France	- Empty backhaul rate of the modes of transport	- Impact factors of transport modes
End-of-life			- Scenario of household packaging waste	- Impact factors of household packaging waste

Other methodological choices

Allocation of agricultural co-products:

For shuttlecocks, the agricultural products to which allocation rules apply are:

- Para rubber tree cultivation: 100 % of the impacts from Para rubber tree cultivation are allocated to latex
- Poultry breeding: as a provisional measure, 5 % of the impact of poultry breeding is allocated to feather production (and 95% of the impact is allocated to the meat). When the repository developed by WG 1 concerned by these products will be published, the allocation value chosen will be applied.
- Feather scrap: if the scraps from feather cutting at shuttlecock production sites are sold for animal feed, there is therefore a co-product of shuttlecock. In this case 100 % of the impact of feather scrap production is allocated to shuttlecock production, and the end-of-life of feather scraps is not allocated to the shuttlecock.

Allocation of the benefits of recycling

The allocation rules governing the benefits and impacts of recycling are the recommended rules set out in the repository BP X 30-323.

Conditions for taking into account end-of-life processes

- **For shuttlecocks**, if there are no specific data available, the end-of-life scenario to be accounted for is the end-of-life scenario for household waste in France.
- **For primary packaging,** the end-of-life has to respect the end-of-life scenario of French household packaging based on the materials.
- **For secondary packaging,** the end-of-life has to respect the end-of-life scenario of French commercial packaging based on the materials.

Accounting for time-delay of carbon emissions

Time-delay of carbon emissions is not taken into account as this aspect is limited. The emissions are accounted among the default approach provides in the annex A of BP X 30-323-0.

Data time validity and update frequency

Any modification by more than 20 % for any of the indicators requires an update of the calculations.

In any case, the update frequency is set at 5 years for the first communication and then every 10 years thereafter.

How data is validated

The company shall keep the information used in the calculations available for any subsequent inspection.

UNIT GLOSSARY

Indicator	Unit	Illustration
Greenhouse effect	kg CO_2 equivalent.	A vehicle emits 0,13kg of CO_2 per kilometer covered
Depletion of mineral and fossil-fuel resources	10e-5 person-reserves	1 person reserve represents a fraction of disponible ressource per person
Fresh water eutrophication	g P eq.	A dishwasher rejects the equivalent of 6,13g of phosphate in the fresh water

ABOUT ADEME

The French Environment and Energy Management Agency (ADEME) is a public agency under the joint authority of the Ministry of Ecology, Sustainable Development and Energy, and the Ministry for Higher Education and Research. The agency is active in the implementation of public policy in the areas of the environment, energy and sustainable development.

ADEME provides expertise and advisory services to businesses, local authorities and communities, government bodies and the public at large, to enable them to establish and consolidate their environmental action. As part of this work the agency helps finance projects, from research to implementation, in the areas of waste management, soil conservation, energy efficiency and renewable energy, air quality and noise abatement.

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