GENERAL PRINCIPLES FOR AN ENVIRONMENTAL COMMUNICATION ON MASS MARKET PRODUCTS

METHODOLOGY FOR THE ENVIRONMENTAL IMPACTS ASSESSMENT OF DISPOSABLE BABY DIAPERS

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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 disposable baby diapers

The repository examined here applies to disposable baby diapers.

Environmental labelling principles

In order to provide consumers with 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 on disposable baby diapers 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 working group on Hygiene products, jointly led by the "GROUP'HYGIENE" and ADEME met on a regular basis from 2009. The GROUP'HYGIENE and its members realized a pilot project on disposable diapers and their work culminated in a repository for this product category, after a consolidation by the working group.

The scope of this repository will be extended, in a second development phase, to other types of diapers, washable baby diapers in particular, when there will be enough information.

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, which is therefore a result. For baby diapers for single use, the functional unit chosen is as follows: **"Renew a baby's diaper during 24 hours"**.

Reference flow

The reference flow designates the quantity of product necessary to satisfy the needs defined by the functional unit. For this study, the reference flow selected is the **Number of disposable baby diapers used per day and per child, [4.16] units/day/baby**

This figure is based on the Consumption statistics in the UK in 2001-2002. It corresponds to an average number of baby diapers calculated over a period of 2.5 years and reduced to 24 hours.

Note that possible consumption of cotton, wipes, etc. or other item used during the change do not enter in the scope.

Disposable baby diapers composition

Disposable baby diapers consist of a plastic outer layer with integral fastenings and a core of absorbent materials with a protective top layer.

The nappy core is composed of fluff pulp (cellulose fiber) and a water-absorbent polymer, sodium polyacrylate (SAP). The top layer is made up of a « non-woven » polymer-based material.

Disposable baby diapers life cycle and study scope

All the stages of the life cycle are taken into account, excepted:

- Stages with **a negligible influence** on the **environmental balance:**
  - The use phase of the disposable baby diaper
  - The production, the transportation to the production site and the end-of-life of tertiary packaging
  - The packaging of raw materials and intermediary products
  - The collection of baby diaper after use and of packaging waste
  - The construction of the production plants, installations and equipment
- That are **excluded by the** methodological repository **BP X30-323**: consumer transport to the point of sale is not directly included in the assessment.

We focus on the impacts of the product itself. The baby diaper is considered without excreta produced by the baby since they are related to the baby's diet.

Disposable baby diapers life circle

Raw materials

Transportation

Components manufacturing

Transportation,

Production of the nappy

Primary and secondary packaging

Transportation

Logistic platforms
Point of sale

Not taken into account in this study

Use

Collection

End-of-life of the nappy and the packaging components

Diapers components :

Fluff pulp (cellulose fiber), water-absorbent polymer, « non-woven » polymer-based material, sodium polyacrylate (SAP), elastics, adhesive films, others...

EXPLANATION OF METHODOLOGICAL CHOICES

Environmental issues and impacts

Environmental impact assessment:

Some criteria have been identified as significant for the overall environmental balance of a hair wash or a shower:

- **Climate change:**

The components manufacturing activities that occur throughout the life cycle of disposable baby diapers result in 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 nonrenewable natural resources**

Production of nappy components and polymers in particular are consumer of non-renewable energy (natural gas, fuel oil, diesel, etc…)
This indicator represents an important issue: the impacts of the life cycle of the nappy are about 4% of the global impacts of an European over one year. Moreover, this indicator allows distinguishing products in the market (a differentiation factor > 2 between min/max values is noticed for a sample of 5 references).

- **Production of ultimate waste**

After use, the end-of-life scenario of the disposable baby diaper is determined depending on the scenarios of household waste management in France (landfilling, incineration). **The impacts of the nappy are about 8% of the global impacts of an European over one year. A differentiation factor of 1.5 between min/max values is noticed (sample of 5 references).**

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 disposable baby diapers

- **Greenhouse gases emissions,** expressed in kg CO2 equivalent
- **Depletion of non-renewable natural resources, expressed in Person.reserve**

(see the Unit glossary)

The indicator concerning the production of ultimate waste is complementary information.

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:

<u>Activity data</u>: 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.

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

The following table summarizes the choices made for disposable baby diapers

Phase	Activity data			Inventory generic data sets
	Specific data	**Semi-specific data**	**Generic data**	
***Raw materials and* Composition of the product**	- Weight of the product (g/nappy) - Quantity and composition of the nappy components	- Data from the manufacturing of fluff pulp (energy consumed transportation of forestry raw materials	- Upstream transportation characteristics of raw materials to the manufacturing site	Impact factors for: - Production and transformation of components: SAP, non-woven, films, fastening, adhesives and elastics - Forest products - Production of chemicals - Production and distribution of combustibles - End-of-life of nappy components
Manufacture	- Site location - Breakdown among various production locations supplying nappies in France (%) - Data for one nappy: intermediary products used, energy consumed, quantity and treatment of waste produced on site			
Primary and secondary packaging		- Number of nappies per Consumer Sales Unit (CSU) - Packaging characteristics		- Impact factors for the production and the end-of-life of primary and secondary packaging
Transport to manufacturing site and to point of sale		- Transport data: type (road, rail, river-sea), distance, road transport: (empty return rate)		- Impact factors of different type of transports
End-of-life				- Impact factors of scenario of household waste end-of-life

Other methodological choices

Allocation between products and co-products

Rules of allocation are necessary to allocate the impacts (energy consumption in particular) of the production stage between products and co-products.
The allocation rule chosen is the number of pieces manufactured on site over the total number of pieces produced on the site, all products considered.

Example: a multi-products site produces an annual volume of 1 million of pieces, of which 100 000 are nappies. The energetic consumption of a nappy, at the functional unit scale retained for this product category, is 4.16/1 000 000e of the total energetic consumption of the site

Modeling of the end-of-life phase

- **For disposable baby diapers:** the end-of-life corresponds to the national data published by ADEME.
- **For packaging:** the end-of-life of the packaging has to respect the end-of-life scenario of French household packaging based on materials used.

Time-lag in greenhouse gas emissions

The time-lag in greenhouse gas emissions is not taken into account. Emissions are accounted among the approach proposed by default in the annex A of the BPX30-323-0 repository.

Data validity period and frequency of updates

If one of the indicators is modified by more than 20%, calculations must be updated.
In all cases, all data shall be recalculated after **5 years for an initial labelling, then every 10 years.**

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 eq.	A vehicle emits 0.13kg of CO_2 per kilometer covered
Depletion of non-renewable natural resources	Person reserve	1 person reserve represents a fraction of disponible ressource per person

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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