Guidelines for preparing Product Category Rules (PCRs)

Danish environmental product declarations programme, EPD-DK.

www.mvd.dk

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Preface

This document is guidelines for preparing product category rules (PCRs) under the Danish environmental product declarations programme, EPD-DK.

The aim of these guidelines is to assist players in a PCR group to prepare the product category rules for their product category. The guidelines also aim to ensure as far as possible that PCRs for the various product categories are uniform.

These guidelines were prepared from 2005 to August 2009 by:

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- Danish Standards Association, Kim Christiansen
- The Danish Institute for Product Development, IPU, Christian Poll (until 2007)

The guidelines for preparation of PCRs are to be revised every five years, or more frequently in the event of updates of programme instructions for EPD-DK, ISO standard 14025:2006, ISO standard 14040:2006 and ISO standard 14044:2006, which affect the verification.

1 Introduction

The purpose of these product category rules (PCRs) is to specify rules for the aspects to be included in the environmental product declaration for a given product category and how the calculations are to be carried out. The PCRs therefore aim to ensure that environmental product declarations for alternative products within the same product category have the most uniform basis possible. The final PCR guidelines must be based on existing life cycle assessments (LCAs) for representative products within the category. Where no LCA exists, an LCA must be prepared to be used as a basis for PCR work. The LCA must be prepared in accordance with ISO 14040 and ISO 14044 for LCA and Programme Instructions for EPD-DK.

The Danish environmental product declaration programme is open for all product categories. PCRs are prepared by users themselves, i.e. enterprises and organisations, organised in a PCR group, on the basis of dialogue with EPD-DK. The PCRs are verified by external environmental and product experts. The PCRs for a specific product category are prepared as an independent document and are verified and approved according to fixed rules.

Standard sentences, which must appear in the PCRs are stated in the PCR template, which is available from the EPD Secretariat.

2 Contents of PCRs

PCRs must be reported in a standard report template with the following contents:

- Preface (not and ISO requirement)
- Definition of the objective of the EPD and the product category for which the PCRs apply (see. section 6.7.1 (a) ISO 14025).
- Description of the product category, including requirements for product properties (see section 6.7.1 (a) ISO 14025).
- Definition of functional unit (see. section 6.7.1 (b) ISO14025).
- Minimum requirements for the boundaries of the system (life cycle stages, processes, inputs/outputs) (see section 6.7.1 (b) ISO14025).
- Description/boundary of processes which must/can be included in system expansion.
- Description of how common processes for multiple products are to be allocated if they cannot be managed through system expansion (see section 6.7.1 ISO14025).
- Types and sources of data to be utilised (see section 6.7.1(b) ISO14025).
- Description/boundary, incl. units, of the LCA-based emissions, resources, energy data, waste and environmental impacts to be included in the EPD (see section 6.7.1 (d, e) ISO14025).
- Supplementary environmental information to be included in the EPD (see section 6.7.1 (f) ISO14025 with reference to section 7.2.3).
- Materials and substances which must be declared, e.g. for product composition, substances harmful to health, etc. (see section 6.7.1 (g) ISO14025).
- Content and format of the EPD (see section 6.7.1 (i) ISO14025).
- Period of validity of the PCRs (see section 6.7.1 (k) ISO14025).

- Reasons for why any life cycle stages, processes, inputs and outputs have been excluded from the EPD (see section 6.7.1 (b) ISO14025).

Annexes to the PCRs must include:

- An account of why any life cycle stages, processes, inputs and outputs have been excluded from the EPD.

The EPD Secretariat must have a final report from the review panel which has verified the PCRs.

3 Preface

The preface must contain the following:

- Description of the product category
- Authors and review panel behind the PCRs
- Date of verification and period of validity

3.1 Definition of the product category

The definition of the product category should be prepared on the basis of definition of the following:

- Primary property of the product.
- Secondary properties of the product.
- The typical material compositions for products in the product category.
- Minimum requirements for the declaration of contents of the product.
- The technical and technological lifetime of the products.

All the above choices must be described and justified with reference to the sources utilised (reports, studies, experience etc.)

You must do the following:

- Primary property, define and describe the primary property/function of the product category; also known as the obligatory property, i.e. the property which the customer is primarily interested in buying.

- Secondary properties, define and describe the secondary properties (qualities) of the product category; also known as the positioning properties, i.e. the properties which the customer also regards as quality, but which are not a compulsory property, although they may make the product preferable to alternative products. State among the secondary qualities the recognised

product certificates (CE marking, ISO/CEN product standards, class) that must and/or may be stated as a minimum.

- Briefly describe the typical material compositions for products in the product category.

- State how the ingredients of the product are to be stated in a declaration of contents (grouping of substances etc.), so that information is given on the composition of the product, while at the same time confidentiality is maintained. If the sales packaging has a significant environmental impact compared with the environmental impact of the product, this must also be determined. Start perhaps with:
  - Substance/material groupings which are already used in the sector.
  - Substances or classes of substances on which there is special legislative focus, e.g. rules for limited contents of specific substances (see www.mst.dk).
  - Substances or possibly classes of substances on which there is special focus, e.g. undesirable substances, the List of Impacts (see www.mst.dk).

- State how the technical and technological lifetime of the product category has been set. The technical lifetime is the quantitative useful life in relation to the technical properties; also known as the physical lifetime, i.e. the time the products are functional before they wear out. The technological lifetime is the lifetime the product is actually likely to be attractive on the market, i.e. the time it exists before it is scrapped because new, more attractive models enter the market.

- You must choose and justify which of the two lifetimes is to be applied in the EPD.

3.2 Definition of functional/reference unit

For intermediate products and end products alike, a quantitative reference unit must be defined based on the product's primary properties/function; also known as a functional unit.

In many cases, the functional unit will not match the consumption of precisely one product. Therefore, in addition to the definition of the functional unit, you should also demand statement of the conversion factor to be applied in order to up or down scale the functional unit to one product. This means the factor the reader of the EPD should divide or multiply the result by in order to obtain the environmental profile for precisely one product in the given EPD.

The functional unit should contain both a qualitative description of the service and a quantification of the service. The quantification should include the duration (time dimension / technical useful life), including lifetime. Thus alternative products with different lifetimes or durations can be compared.

You must define the functional unit for the product category on the basis of (section 3.1):

- Primary property of the products/services
- The technical and technological lifetime of the products/services
- The duration of the products/services.

You must do the following:

- On the basis of the definition of the product category in section 3.1, you should briefly describe the product category qualitatively on the basis of the primary property.
- Starting with the primary property, the functional unit is quantified on the basis of the duration, and the unit is stated per year of life or per no. xx-uses, possibly with further specification of, e.g. specific conditions, temperature etc.

3.3 Minimum requirements for the boundary of the system

The boundary of life stages, processes, input and output should be set on the basis of an LCA completed according to the ISO 14040 series. If there is no LCA available, a new LCA

must be prepared in accordance with ISO 14040 and ISO 14044 as well as Programme Instructions for EPD-DK.

You must do the following:

- Obtain existing LCAs and other relevant environmental assessments for the product category, search publications from the Danish EPA www.mst.dk, ask around the sector, search the internet, ask at the LCA Center www.lca-center.dk or ask consultants/advisors.
- Discuss with the review panel whether existing LCAs can be used and whether they meet the requirements of the ISO 14040 series (ISO 14040, ISO 14041, ISO 14042, ISO 14043) or ISO 14044, which is a compilation of ISOs 14041-14043).
- If no usable LCAs are available, an LCA for the product category must be drawn up in accordance with ISO 14040 and ISO 14044 as well as Programme Instructions for EPD-DK. Do a preliminary mapping or use existing mapping as the basis for choosing or excluding inputs and outputs etc.
- Choose and exclude inputs and outputs as well as any complete processes or life stages.

B3.3.1 Preliminary mapping

In the long term, the aim is to establish a database under the EPD-DK programme at Danish Standards, which can be used for mapping and calculation, but until then the approach described below should be used.

In order to make choices or exclusions, it may be necessary to complete a preliminary mapping of processes and their inputs and outputs, if a usable mapping is not already available. The mapping should be included as an annex to the PCRs.

Within some product categories, very different materials and chemicals are used to manufacture products with the same function. Therefore, the types of process and thus the environmental impact in life stages can vary greatly from product to product.

When choosing and excluding processes, inputs and outputs are examined of chemicals, emissions, waste and energy.

As a general rule, data for the marginal processes should be used and in this respect the time frame for the raw-materials stage and the production stage should be a minimum of five years, which is the maximum for the EPD. For the use and disposal stages, the time frame should correspond to the given lifetime for the product.

You must do the following:

- Outline the lifecycle and its processes in a flowchart and/or in a table.
- Identify the inputs and outputs that can typically be excluded for the product category on the basis of the recommended cut-off criteria stated in the Programme Instructions for EPD-DK.
- Identify data sets for the typical raw materials and main processes which are likely to be part of the life cycle of the product category. See criteria in the Programme Instructions for EPD-DK.
- With regard to processes, materials or substances which cannot be chosen or excluded at PCR level, use the recommended cut-off criteria stated in the Programme Instructions for EPD-DK.

B3.3.2 Types and sources of data

With regard to the most important materials and processes in the product category, typical marginal processes and the associated data sets should be described in the PCRs, if possible. For more, see the Programme Instructions for EPD-DK.

You must do the following:

- Describe the marginal processes and any data sets to be used for selected materials and processes in the PCRs, see the Programme Instructions for help in identifying the marginal processes and contact sector associations etc. who can help identify markets and marginal processes.
- With regard to processes and data which are not known at PCR level, note that the types and

sources of data stated in the Programme Instructions for EPD-DK must be used.

B3.3.3 Lifecycle stages

All lifecycle stages from "cradle to grave" must be analysed in the PCRs and any life stages omitted must be justified for in the PCRs.

The lifecycle can be divided into the following lifecycle stages:

a) Raw material extraction and processing
b) Production of intermediate products (semi-finished goods)
c) Production of the end product
d) Use of the end product
e) Disposal of the end product
f) Within the PCRs, transport must either be summarised in a "transport" stage or allocated to the life stages in which transport takes place. Note when using existing LCA data for materials, that transport is often included and therefore it will be easiest to include transport in the life stages it links to, rather than establishing a separate stage.

For intermediate products which are to be part of an unknown end product, stage c) production of the end product; stage d) use of the end product; and stage e) disposal, should not be included in the EPD. This means an EPD is prepared from "cradle to gate".

The PCRs should include a flowchart clearly illustrating which life stages should be included, and which excluded, and the primary processes in the lifecycle stages should be shown.

With the approval of the review panel, the PCR group must state reasons for excluding inputs and outputs as well as whole lifecycle stages.

You must do the following:

- Analyse the given LCAs and the preliminary mapping and assess which life stages can be excluded, and which must be included, then

account for this, possibly using sensitivity analysis.

- State which life stages are to be included in the EPD and which are to be excluded. Briefly describe the main activities in the given life stages.
- Draw up a flowchart clearly illustrating which life stages and primary processes should be included, and which are to be excluded.

B3.3.4 Sensitivity analysis

A sensitivity analysis can be completed of the boundaries and exclusion data, processes and life stages. A sensitivity analysis is an assessment of the uncertainty associated with a given choice. The analysis should contain the following elements:

- Assessment of whether the processes and life stages excluded have been excluded in accordance with the stated boundary criteria.
- Assessment of whether the processes and life stages included are significant according to the stated boundary criteria.
- Assessment of whether the specified process types and data sources and types comply with the requirements in the Programme Instructions for EPD-DK.
- Whether the boundary (exclusions/inclusions) for processes and life stages is biased or representative for the various product types included in the product category.
- Whether the uncertainty for exclusion/inclusion of processes and data is acceptable

B3.3.5 Processes in system expansion

When setting the system boundary for a given product, care must be taken to ensure that the EPD only covers the primary product or service. Secondary products, such as by-products or by-services, must therefore be eliminated from the system by deducting the services which the secondary products replace.

Typical secondary products in the product category must be identified and the possible products they replace must be clarified as well as how they are to be deducted from the system.

During system expansion, as far as possible there should be reference to which processes should be credited with the displaced processes. In general, data for the marginal processes should be used. The time frame for data under the various life stages is stated in the Programme Instructions for EPD-DK.

You must do the following:

- Identify which typical and possible secondary products are common for several products in the lifecycle.
- Find out which products the secondary products replace (substitute) and state these in the PCRs.
- Find out whether there are data sets for the products substituted and state these in the PCRs (see data requirements in the Programme Instructions for EPD-DK).

B3.3.6 Allocation of environmental impacts from common processes for several products

Allocation can be utilised in cases where it is not possible to identify and/or eliminate the secondary services through system expansion. When utilising allocation, processes are identified which contribute to the secondary services or common processes for several products, and the environmental impacts are allocated between the services/products.

You must do the following:

- Identify and describe the typical processes to be allocated, i.e. which contribute to secondary services or common processes for several products.
- Describe how they are to be allocated, see the Programme Instructions for EPD-DK.
- For processes for which allocation cannot be assigned at PCR level, see the allocation models in the Programme Instructions for EPD-DK.

3.4 Emissions, resources, energy data, waste and environmental impacts

You must state the specific emissions, resources, waste types and environmental impacts it is compulsory to disclose for the product category. The parameters should be stated for the life stages and processes lying within the boundary. The parameters should be selected on the basis of at least one LCA completed in accordance with the ISO 14040 series and possibly on the basis of other supplementary environmental assessments relevant for the product category.

The number of parameters should be limited so that only the most important in an environmental context are disclosed.

You must do the following:

- Identify the most important emissions/discharges in an environmental context for the following recipients and set up requirements for information about these in the EPD.
  - Soil (g/functional unit)
  - Water (g/functional unit)
  - Air (g/functional unit)

- Identify the most important resource consumption (g/functional unit), including consumption of resources with a limited supply horizon, and set up requirements for information about these in the EPD.

- You must set requirements that the most important waste amounts for landfillling be divided into the following four categories:
  - Hazardous waste (g/functional unit)
  - Radioactive waste (g/functional unit)
  - Slag and ash (g/functional unit)
  - Bulk waste (g/functional unit)

- You must set requirements that the most important energy consumption be converted into primary energy divided into the following two categories:
  - Process energy (MJ/functional unit)
  - Material energy (MJ/functional unit)

- You must set requirements that the selected compulsory emissions to the soil, water and air must be converted to the environmental impacts below:
  - Global warming (kg CO_2 equiv.)
  - Ozone depletion (kg CFC11 equiv.)
  - Acidification (kg SO_2 equiv.)
  - Photochemical ozone formation (kg C_2H_4 equiv.)
  - Nutrient enrichment (kg NO_3 equiv.)

- You must set requirements that the parameters selected are to be disclosed divided between the defined lifecycle stages and as a total.

B3.4.1 Calculation of the selected compulsory environmental impacts

When converting an emission to its contribution to a given environmental impact, the impact factors in an annex to the Programme Instructions for EPD-DK should be used.

3.5 Additional environmental information

You must state the additional environmental information to be disclosed for the product. The other information should conform with the requirements of:

- ISO 14020 *Environmental labels and declarations - general principals*
- ISO 14021, point 5 *Environmental labels self-declared environmental claims - Types II environmental labels.*

You must do the following:

- Discuss which additional environmental information could be relevant to disclose for the product category. Possibly start with:
  - Environmental issues often debated in the sector
  - Environmental issues you receive from customers
  - Parameters on which there is special legislative focus, e.g. rules for limited contents of specific substances (see www.mst.dk).
  - Parameters on which there is otherwise special focus, e.g. undesirable substances, the List of Impacts (see www.mst.dk).
  - Criteria for eco or energy labels (see http://www.ecolabel.dk)
  - Hot spots from "Miljøvejledninger for offentlige indkøbere" (www.miljoevejledninger.dk)
  - Environmental certification schemes (ISO 14001, EMAS etc.)
- Account for which additional environmental information is deemed relevant to disclose for the

product category. Check whether it complies with the current ISO requirements.

- State the additional environmental information with units and any requirements for calculation or measurement methods.

4 Verification

Verification of the PCRs should be in accordance with *"Verification of PCR"*. Verification should be by the review panel. It is important that the PCR group start the dialogue with the review panel early in the process to ensure that usable data and boundaries are applied. Of particular importance is dialogue/clarification of usable LCAs, limits for the lifecycle, functional unit as well as system expansion or allocation etc.

It is recommended that the PCR group review their draft PCRs themselves, see *"Verification of PCR"*, before they submit the draft for final review.

5 EPD template

The PCRs must require that the EPD is presented in the EPD template from EPD-DK. The template is available from the EPD Secretariat.

6 References

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