

# Verification of PCRs

*in the Danish environmental product  
declaration programme*

December 2007

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## Foreword

This guide contains a procedure for verifying product category rules (PCRs), including the background material.

The procedure has been prepared by:

The consortium behind development of the EPD programme:

- EKJ consulting engineers ltd (EKJ)
- The Danish Institute for Product Development (IPU)
- Danish Standards (DS)
- The Swedish Environmental Management Council
- Valør og Tinge A/S

With feedback from the associated system group (professional sparring):

- 2.0- LCA consulting, later replaced by Danish Standards (DS)
- Rambøll, later replaced by Hirsbak Consulting
- FORCE Technology
- The Danish Building Research Institute (SBI)
- The Confederation of Danish Industries (DI)
- The Danish Environmental Protection Agency

## 1. Background

The Danish environmental product declaration programme must fulfil, as a minimum, the requirements in the ISO 14025 international standard, "Environmental labels and declarations – Type III environmental declarations – Principles and procedures". This means the programme must also comply with ISO 14040, Environmental management – Life cycle assessment – Principles and framework", ISO 14044, "Environmental management – Life cycle assessment – Requirements and guidelines", and ISO 14020, "Environmental labels and declarations - General principles".

In relation to ISO standards, verification is defined as follows:

"Verification: confirm, through the provision of objective evidence, that specified requirements have been fulfilled", ISO14025:2006 section 3.9.

The general aim of verification is to ensure the programme is reliable and uniform. This is to be achieved by verifying that the product category rules (PCRs) and background material such as life-cycle assessments (LCAs) and environmental product declarations (EPDs) are prepared in accordance with the applicable standards and guidelines for the EPD programme.

### 1.1 Abbreviations and definitions

**Allocation:** Partitioning of environmental exchanges from processes that contribute to more than one product or service, for example, when several products are produced from one process, or if the material from one product is re-used in another product.

**Characterisation:** Grouping emissions that contribute to the same environmental effect and calculating their equivalent contribution to the given environmental effect.

**Consequence LCA:** Assessment of the future environmental consequences that will result from the choice of a given product.

**EDIP:** Environmental Design of Industrial Production, a Danish method for Life Cycle Assessment (LCA).

**Environmental aspect:** Element of an organisation's activities, products or services that can interact with the environment.

**Environmental impact:** Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects.

**EPD:** Environmental product declaration.

**Information module:** Compilation of data to be used as a basis for a Type III environmental declaration, covering a unit process or a combination of unit processes that are part of the life cycle of a product (ISO 14025, section 3.13).

**ISO:** International Organization for Standardization – a worldwide federation of national standards bodies.

**ISO 14025:** DS ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and procedures.

**ISO 14040:** DS/EN ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework.

**ISO 14044:** DS/EN ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines.

**ISO 14020:** DS/EN ISO 14020:2002 Environmental labels and declarations – General principles.

**ISO 14021:** DS/EN ISO 14021:2001 Environmental labels and declarations - Self-declared environmental claims (Type II environmental labelling).

**LCA:** Life Cycle Assessment. An environmental assessment of the major environmental impacts for the processes of a product or service throughout its life cycle, from “cradle to grave”.

**Marginal processes:** Processes affected in practice by the market through changes in demand. I.e. processes that are accelerated or decelerated when the market for a product increases or decreases.

**Normalisation:** calculating the proportion of the characterised environmental effects and resource consumption in relation to society’s background impact for the given effect or resource. The background impact is expressed as “impact per person, per year” for the given effect or resource.

**Product:** A product or service.

**PCR:** Product Category Rules.

**Primary energy:** Process energy and calorific value for materials. The calorific value is the energy contained in the materials that can be utilised through combustion.

**System boundary setting:** boundary setting of the system being environmentally assessed, i.e. selecting inputs and outputs to be included in the environmental assessment and specifying how to include them, and the environmental impacts and resource consumption the environmental assessment is to be expressed in terms of.

**System expansion:** Elimination of a product’s secondary services. Elimination takes place by deducting from the environmental assessment the environmental impacts of the products the secondary products will replace in the market.

**Technical lifetime:** The product’s physical lifetime – the time the product can function normally before becoming worn out.

**Technological lifetime:** The time the product is expected to be in use before it is realistically disposed of for technological reasons, such as changes in fashion, new technology or new local requirements that lead to the product being scrapped before it is worn out.

## 2. Contents of a PCR

PCRs must identify and document the purpose and boundary setting of the LCA-based information for the given product category, and rules for preparing additional environmental information. PCRs must also indicate the life-cycle phases and parameters to be included, and how parameters are to be collected and reported. PCR contents must be based on one or more LCAs that fulfil the requirements in the ISO 14040 series and other relevant studies identifying additional environmental information (cf. ISO 14040 section 6.7). Further it shall be ensured that the PCR is harmonised with existing PCRs from other EPD programmes as far as the programme instruction allow.

Within the EPD-DK, PCRs must be reported using a standard report template containing:

- Foreword (not an ISO requirement)
- Purpose of the EPD and product category the PCR applies to (cf. ISO 14025 section 6.7.1).

- Description of the product group, including product characteristic requirements (cf. ISO 14025 section 6.7.1 (a)).
- Definition of functional unit/reference unit (cf. ISO 14025 section 6.7.1(b)).
- Minimum system boundary setting requirements (life-cycle phases, processes, inputs and outputs) (cf. ISO 14025 section 6.7.1 (b)).
- Specification/boundary setting of processes to be included in system expansion.
- Information on how common processes for multiple products are to be allocated if they are not dealt with during system expansion (cf. ISO 14025 section 6.7.1).
- Data types and sources to be used (cf. ISO 14025 section 6.7.1 (b)).
- Specifications/boundary setting, including units, for LCA-based emissions, resources, energy data, waste and environmental effects to be included in the EPD (cf. ISO 14025 section 6.7.1 (d, e)).
- Additional environmental information to be presented in the EPD (cf. ISO 14025 section 6.7.1 (f)).
- Materials and substances to be declared, e.g. product composition, harmful substances, etc. (cf. ISO 14025 section 6.7.1 (g)).
- EPD content and format (cf. ISO 14025 section 6.7.1 (i)).
- The period of validity of the PCR (cf. ISO 14025 section 6.7.1 (k)).
- Explanation for any life-cycle phases, processes, or inputs or outputs omitted from the EPD (cf. ISO 14025 section 6.7.1 (b)).
- Final report from the review panel that has verified the PCR

A PCR can be seen as an LCA with no calculations performed, i.e. PCRs contain rules for boundary setting, data, calculation methods and selection of environmental parameters, but no actual results of these. The results are presented in the subsequent EPD.

### 3. PCR verification requirements

Verification within the EPD-DK must fulfil, as a minimum, the requirements in ISO 14025 for Type III environmental product declarations.

The PCR review shall:

- be conducted by a third-party panel (cf. 8.1.2)
- ensure competent, independent verifiers are appointed to the review panel (cf. section 6.3 (h))
- be based on a PCR review procedure, including scope of the review, PCR review details, and directions for review panel composition (cf. section 6.3.1(i))

The term, “review”, in ISO 14025 is equivalent to “critical review” in the LCA ISO 14040 and 14044 standards, and is defined as follows:

“Critical review” is the process of verifying that an LCA study fulfils method, data, interpretation and reporting requirements in the standards.

#### 3.1 PCR review

A critical review (cf. ISO 14025 section 8.1.2) must ensure that:

- The PCR conforms to the ISO 14040 series and section 6.7.1 of ISO 14025.
- The PCR conforms to the EPD programme’s general programme instructions.
- The LCA-based data and additional environmental information presented in the PCR cover the most significant environmental aspects for the product.

The review of LCA-based information must observe the LCA review principles in ISO 14040 and 14044 and hence assess whether:

- The methods used conform to the international ISO 14044 standard (cf. ISO 14040 section 6.1).

- Method, data, interpretation and reporting requirements conform to LCA principles (ISO 14040, section 7.1).
- Classification, characterisation, and (if carried out) normalization, grouping and weighting are complete and documented such that it is possible to interpret the LCA (cf. ISO 14040 section 7.3.1).
- The methods used are scientifically and technically valid (cf. ISO 14044 section 6.1)
- The data used is appropriate and reasonable in relation to the goal of the study (cf. ISO 14044 section 6.1).
- The interpretations reflect the limitations identified and the goal of the study (cf. ISO 14044 section 6.1)
- The report is transparent and consistent (cf. ISO 14044 section 6.1).

## 3.2 Review panel

Review panel composition:

- According to ISO 14025 section 8.1.2, the PCR review must be conducted by a third-party panel, comprising a panel chairman and two other members as a minimum.
- The panel chairman is appointed by the "original study commissioner" (interpreted in the EPD-DK as the programme operator in cooperation with the PCR group). The panel chairman appoints the other two members (cf. ISO 14040 section 7.3.3) in cooperation with the PCR group. Within the EPD-DK, it has been decided that the panel chairman is to be the review panel's LCA specialist. The panel chairman is selected by the PCR group from a list of LCA specialists approved by the EPD-DK. The list is reviewed at least every three years.

The combined competencies of the review panel must include:

- Knowledge of the relevant sector, product and product-related environmental aspects (cf. ISO 14025 section 8.2.3).
- Expertise in LCA and methodology for LCA work (cf. ISO 14025 section 8.2.3).
- Awareness of relevant standards in the fields of environmental labelling and declarations and LCA (cf. ISO 14025 section 8.2.3).
- Knowledge of the regulatory framework within the scope of the PCR (cf. ISO 14025 section 8.2.3).
- Knowledge of the programme for Type III environmental declarations (cf. ISO 14025 section 8.2.3).
- The panel chairman shall be external and independent of the study (cf. ISO 14044 section 6.3).

The panel chairman must write a brief CV for the review panel, to be used to assess whether the panel fulfils the required competencies. The CV must be entered into a template provided by the EPD-DK, and submitted to the EPD secretariat. If the EPD council believes the required competencies are not fulfilled, the panel chairman will be instructed to supplement the panel by finding the competencies that are lacking.

## 3.3 Reporting

The panel's review report must contain:

- An independent report commenting on whether the aspects specified in section 4.2 of this guide are completely described in the PCR.
- A description of the review result and panel comments and recommendations to be inserted in the PCR (cf. ISO 14025 section 8.1.2).

The review panel shall report observations from the review, including any panel disagreements, taking into account the confidentiality of the data. The report shall be available to any person upon request.

## 4. Verification of PCRs

This section contains verification of PCRs in the EPD-DK.

### 4.1 Verification process

1. One or more enterprises or organisations inform the EPD secretariat that they wish to prepare a PCR for a given product category. They establish an ad hoc PCR group, possibly with assistance from the secretariat, consisting of at least three enterprises/organisations, if at all possible. The PCR group is advertised at [www.mvd.dk](http://www.mvd.dk) and by notifying the relevant sector associations and other interested parties, so that other stakeholders can enrol in the project.
2. The PCR group sends a timetable for the work to the EPD secretariat, including an indication of when they want the PCR verified. The PCR work must be completed within one year. The PCR group appoints a review panel chairman from the list of approved verifiers. The panel chairman appoints the two other panel members in cooperation with the PCR group. The EPD secretariat recommends the review panel to the EPD council for approval.
3. The appointed PCR group prepares a draft PCR based on official EPD-DK documents ("Programme instructions", "PCR guide" and "Verification of PCRs"), ISO 14025, 14044 and 14021, and existing LCAs and other environmental assessments, etc., relevant to the product category.
4. The draft PCR is sent to the EPD secretariat where it is submitted for public hearing for three weeks via the EPD-DK website. Anyone is welcome to submit comments. The PCR group also send a list of significant interested parties to the EPD secretariat, who in turn notify all parties on the list that the PCR is open for public hearing. Significant interested parties are typically enterprises, sector associations, and other major stakeholders for the particular product category.
5. The secretariat records all public hearing comments and forwards them to the PCR group for consideration.
6. The PCR group edits the PCR and submits the edited version to the review panel for verification.
7. The review panel verifies the PCR, writes a verification report, and returns this to the PCR group, sending a copy to the EPD secretariat.
8. The PCR group edits the PCR in light of the review panel comments and re-submits the edited version to the review panel.
9. The review panel verifies that the recommended changes have been correctly incorporated and, if so, recommends the PCR to the EPD council for approval. Otherwise, the review panel will normally meet with the PCR group to resolve outstanding issues before recommending the PCR to the EPD council.
10. Once the PCR has been approved, it is forwarded to [www.mvd.dk](http://www.mvd.dk) for publication by the EPD secretariat. The EPD secretariat informs the interested parties on the list mentioned at point 4 that a PCR is now available for the given product category, to the benefit of players in the given product area.

The PCR is reviewed within five years of approval, or earlier if there are major technological changes affecting the environmental impacts for the product category, or if the EPD programme guidelines are changed. The EPD secretariat initiates a new PCR group by simply contacting the

chairman or secretary for the previous PCR group and the relevant sector associations and enterprises. Points 2-10 of the procedure above are then repeated.

The basic process, from preparation of a draft PCR to approval, is illustrated in Figure 1.

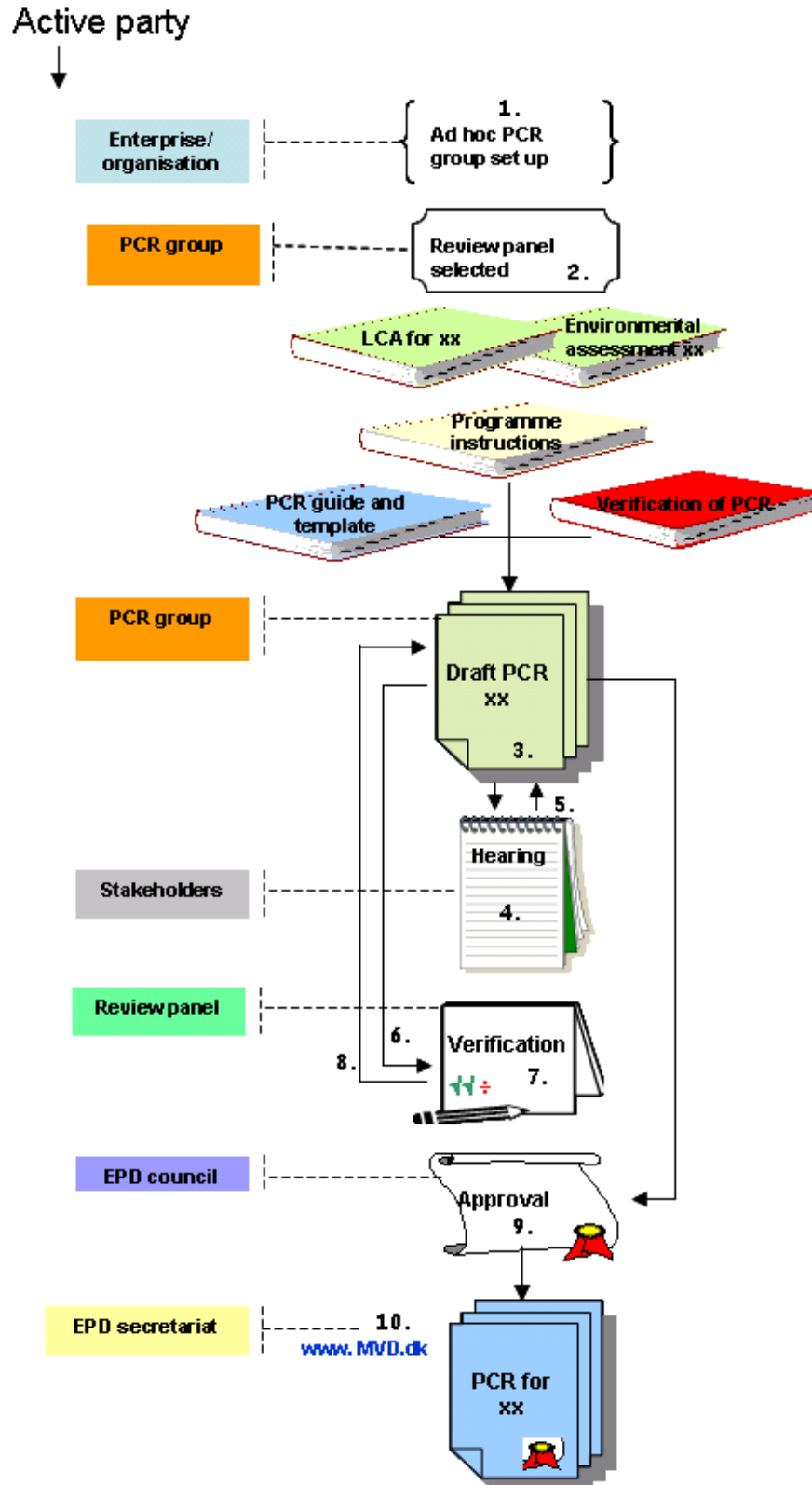


Figure 1. PCR evolution process

## 4.2 What must be verified

To ensure good, uniform verification, the items listed below in sections 4.2.1 – 4.2.15 must be reviewed. These items have been selected based on the general programme instructions and product category rules (section 6.7) of EPD-DK, and on ISO 14025, ISO14040, ISO 14044, ISO 14020 and the Guide to critically reviewing LCAs (N. Caspersen, H. Wenzel 2002).

### 4.2.1 Foreword

Does the foreword contain:

- Identification of the product category
- Authors and review panel behind the PCR
- Verification date and period of validity
- References to background material (LCAs etc.)?

### 4.2.2 Definition and description of the product category

Has the product category been clearly described, including:

- The product's primary service.
- The product's secondary service.
- Typical material compositions for products in the product category.
- Minimum requirements for the product's content declaration, i.e. directions for the materials and substances to be declared under product composition, and any harmful substances, etc. to be declared.
- The product's technical and technological lifetime, and an assessment of whether these are realistic?

### 4.2.3 Definition of functional unit/reference unit

Is the functional unit:

- Qualitatively described based on the service
- Quantified based on the service
- Accurate, and can it be used as a basis for comparing alternative products in the product category?

### 4.2.4 Life-cycle phases

Have the primary activities and processes in the following life-cycle phases been described:

- Raw material extraction and processing
- Production of components (semi-finished goods)
- Production of the end product
- Use of the end product
- Disposal of the end product
- Geographical factors?

Within the PCR, transport must either be summarised in a "transport" phase or allocated to the life-cycle phases in which transport takes place.

Has a qualified introductory analysis and assessment been carried out based on one or more LCAs (that conform to ISO 14040 and ISO 14044)?

Has a flow diagram been provided clearly showing the life-cycle phases and primary processes to be included and omitted?

Is there clear indication of which life-cycle phases may be omitted and which must be included?

### 4.2.5 Minimum requirements for system boundary setting

- Have specific boundary setting criteria been indicated for life-cycle phases, processes, and inputs and outputs in accordance with the requirements in the programme instructions?

#### 4.2.6 System expansion

Steps must be taken to ensure the system has only been subject to boundary setting for the primary product or service the EPD is prepared for. The secondary products, such as by-products or services must therefore be eliminated from the system by deducting the services the secondary products replace.

Have the typical processes common to multiple product types been identified, i.e. processes that contribute to secondary services or common processes between several products?

Have the products the secondary products replace (substitute) been investigated and are the ones to be deducted from the system listed?

Are there datasets for the products being deducted? Has this been investigated, and if datasets have been found, are they listed, or is there a reference to a publicly available source? Do these datasets conform to the requirements in chapter 8.3 and 8.4.2 – 8.4.6 of the programme instructions?

#### 4.2.7 Allocating common processes across several products

For the typical processes common to several products and not eliminated during system expansion, does the PCR specify that these must be allocated between the products?

For any common processes and secondary services, even those not identified in the PCR, does the PCR specify that these must be allocated in accordance with the requirements in chapter 8.2 of the programme instructions?

#### 4.2.8 Data types and sources

Have the marginal processes and associated datasets to be used for the common materials traded on the global, EU or Scandinavian wholesale markets been specified? Are these datasets acceptable and do they accurately represent the processes' environmental impacts?

For other processes and data not known at the PCR level, does the PCR specify that the data types and data age stated in chapter 8.4.2 – 8.4.6 of the general guidelines must be used?

#### 4.2.9 LCA-based environmental information

##### Analysing environmental aspects and assessing environmental impacts

Have the specific emissions/discharges in the following categories that have to be accounted for been specified, and are they environmentally significant for the product category?

- To soil (g/functional unit)
- To water (g/functional unit)
- To air (g/functional unit)

Have the specific resource consumption levels (g/functional unit) that must be accounted for been specified, including consumption levels for resources with very limited future supply (cf. the EDIP factors in Annex 3 to the programme instructions), and are they environmentally significant for the product category?

Have requirements been stated for reporting the major volumes of waste for landfill, which contribute to the following four categories in accordance with the EDIP method?

- Dangerous waste (g/functional unit)
- Radioactive waste (g/functional unit)
- Slag and ash (g/functional unit)
- Bulky waste (g/functional unit)

Have requirements been specified for reporting the major energy consumption levels converted to primary energy, divided between the following two categories?

- Process energy (MJ/functional unit)
- Material energy (MJ/functional unit)

Is there a requirement stating that the listed environmental impacts must be reported, divided between the defined life-cycle phases, and as a total?

Conversion / characterisation

Is there a requirement that the selected emissions to soil, water and air, must be converted to the environmental impacts to which they contribute?

- Greenhouse effect (kg CO<sub>2</sub> equiv.)
- Ozone-layer depletion (kg CFC11 equiv.)
- Acidification (kg SO<sub>2</sub> equiv.)
- Photochemical ozone formation (kg C<sub>2</sub>H<sub>4</sub> equiv.)
- Nutrient load (kg NO<sub>3</sub> equiv.)

Is there a requirement that the conversion be done using the EDIP method factors specified in the programme instructions?

Is there a requirement stating that the calculated environmental impacts must be reported, divided between the defined life-cycle phases, and as a total?

**4.2.10 Additional environmental information**

Has the additional environmental information to be reported been specified, including units for the quantitative information?

Does the additional environmental information conform to the requirements in:

- ISO 14020 *Environmental labels and declarations – general principles*
- ISO 14021 section 5 *Environmental labels and declarations - Self-declared environmental claims (Type II environmental labelling)*?

Is the additional environmental information relevant to the environmental description of the product?

**4.2.11 Content and format of the EPD**

Does the PCR refer to the EPD template in EPD-DK shall be used and fulfilled?

**4.2.12 PCR period of validity**

Has space been provided to insert the PCR period of validity once verification is complete and the EPD council has approved the PCR?

**4.2.13 Explanation for omitted life-cycle phases, processes, inputs and outputs**

Has an accurate sensitivity assessment been performed, and does it contain the following?

- Assessment of whether the omitted processes and life-cycle phases have been omitted in accordance with the prescribed boundary setting criteria.
- Assessment of whether the included processes, life-cycle phases and assumptions are significant in accordance with the prescribed boundary setting criteria.
- Assessment of whether the specified process types and data sources and types comply with the requirements in the programme instructions.
- Assessment of whether boundary setting (omission/inclusion) of processes and life-cycle phases is biased or representative for the various product types included in the product category.
- Assessment of whether uncertainties for the omission/inclusion of processes and data are acceptable.

**4.2.14 PCR reporting**

- Has the EPD-DK PCR template been used?
- Is the PCR transparent and consistent?
- Have the ISO 14025, 14044 and 14021 requirements been met?
- Have references been supplied for existing PCRs in other programmes?

**4.2.15 Public hearing responses from stakeholders**

- Is there a public hearing memorandum?
- Has assessment been made of whether the submitted public hearing responses are significant to the PCR?
- Have the significant comments from the public hearing been incorporated?