Product Category Rule Module for Market Pulp and Paper Products

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Period of Validity

The final version of this PCR will be valid for five (5) years from the date of its issue.

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Introduction

This Product Category Rule (PCR) module specifies the requirements for completing Life Cycle Assessment (LCAs) and preparing Environmental Product Declarations (EPDs) for market pulp and paper products. This PCR module conforms to the N505 document,[1] draft LEO-S-002,[2] ISO 14025, 14040 and 14044, and the PCR Module for Roundwood.

This PCR module is intended to be used in conjunction with an accompanying PCR Module for Roundwood, and Life Cycle Impact Assessment Methodology (LCIA) Document. Use of these three documents allows for the establishment of LCAs and EPDs for pulp and paper.

The LCA methodology contained in these documents is intended to provide standardized protocols for addressing all relevant environmental and human health impacts from wood and paper production. These relevant impacts are based on the observable alterations compared to preindustrial conditions for many impact categories of environmental change, all of which can be linked back to anthropogenic activities related to logging and/or pulp/papermaking. In order to practically and consistently assess the degree of change within these impact categories in different instances, these protocols also contain detailed algorithms and data requirements for each type of evaluation. These algorithms are intended to provide results which are of a high enough precision and accuracy to be useful in decision making, product comparisons, improvement in environmental conditions, and in other applications of LCA in this context. Users of this PCR module are encouraged to become familiarized with the LCIA Methodology Document and the Roundwood PCR Module. In this PCR module, references are made to those documents where necessary.

In developing this PCR Module, existing PCRs for market pulp and paper were reviewed. The reason for developing this PCR is because these PCRs do not account for the terrestrial ecosystem impacts or effects on biogenic carbon storage resulting from the full life cycle of market pulp and paper. This PCR Module requires that the life cycle impact assessment (LCIA) phase include all of the core impact categories associated with the market pulp and paper life cycle, in accordance with the impact categories of the N505 ballot.

1 Scope

This PCR module provides rules and guidance for completing LCAs and developing EPDs for market pulp and paper products. The rules and guidance described here can be used in many LCA applications, including:

[1] The N505 document was submitted by representatives from the US Technical Advisory Group to the ISO TC 207 as a formal set of revisions for the ISO 14044 LCA standard. The document contains requirements pertaining to LCA which are applicable in this document and in these PCR modules. Available at: https://www.scsglobalservices.com/resource/technical-review-of-life-cycle-impact-assessment-phase

[2] LEO-S-002, Second Public Comment Version, Available July 2016 at http://www.leonardoacademy.org/programs/standards/life-cycle.html

- LCA reports for internal or external use.
- Decision-making in procurement, policy setting, or other settings.
- Single impact LCA studies (e.g., climate footprint or land use assessment studies), provided these are not used as the basis of comparisons between products or as the basis of EPDs.
- Other tools based in LCA.

2 Normative References

The following documents, in whole or in part, are normatively referenced in this PCR and are indispensable in its application:

- Roundwood PCR Module, Public Comment Version, December 2015.
- Life Cycle Impact Assessment Methodology for PCR Modules for Roundwood and Pulp/Paper.

All normative references in these documents are considered normative for this PCR Module as well.

3 Terms and Definitions

The following terms and definitions apply under this Product Category Rule Module. See Roundwood PCR Module and LCIA Methodology Document for other relevant terms and definitions.

Term	Definition
Brightness	Diffusive reflectance of blue light from a pad of pulp sheets from light having a wavelength of 457 nm. Brightness can be reported using the TAPPI T 452 or T 525 standards or ISO 2470-1:2009 standard (ISO brightness).
Elemental Chlorine Free	Pulp and paper bleaching processes that include the use of chlorine derivatives (e.g. chlorine dioxide, sodium hypochlorite) but no elemental chlorine gas. May apply to either virgin or recycled pulp and paper production.
Fiber basket	The combination of the virgin and recycled fiber basket of a virgin or recycled fiber pulp mill.
Processed Chlorine Free	Pulp and paper bleaching processes that use no chlorine chemistries; usually applied to applicable recycled pulp and paper production. Also may be referred to as Totally Chlorine Free, although this is more often connected to applicable virgin pulp and paper production. Examples of PCF bleaching chemicals include ozone, oxygen, and peroxide.
Recycled fiber basket	The region supplying recovered fiber to a pulp mill.
Totally Chlorine Free	See Processed Chlorine Free.
Virgin fiber basket	The region supplying virgin pulpwood or virgin plant fibers to a pulp mill.[3]

[3] At this time, this PCR module does not treat impacts from plant fibers. Operationally, the scope of the virgin fiber basket is limited to virgin pulpwood sources.

4 Abbreviations

The following abbreviations apply under this Product Category Rule.

CH_4	Methane
CO_2	Carbon dioxide
CPC	Central Product Classification
ECF	Elemental Chlorine Free
EPD	Environmental Product Declaration
FAU	Forest Analysis Unit
LCA	Life Cycle Assessment
PCF	Processed Chlorine Free
PCR	Product Category Rule

5 General aspects

5.1 Objective of this PCR

This PCR module establishes a set of consistent rules, requirements and additional guidance for the preparation of EPDs for market pulp and paper products and for other LCA applications. This PCR module also specifies the underlying requirements of the LCA upon which the EPD is based.

5.2 Comparability of EPDs for market pulp and paper products

This PCR Module can be used to develop cradle-to-grave EPDs which cover all life cycle stages of paper. Additionally, cradle-to-gate EPDs can be created which assess all life cycle stages from raw material extraction through production of market pulp or paper, but excluding end-of-life.

EPDs produced under this PCR module shall only be compared if:

- EPDs are cradle-to-grave (i.e., all life cycle stages of paper are included), or
- For cradle-to-gate EPDs, only if the market pulp and paper products covered have identical functional and end-of-life characteristics, and will be used and disposed of in the same fashion.

5.3 LCA Report

Must follow the Roundwood PCR Module. There are no additional guidance or requirements.

6 Product Category Rules for LCA

6.1 Goal and Scope Definition for the LCA

Must follow the Roundwood PCR Module. There are no additional guidance or requirements.

6.2 Product Category Definition

For this PCR module, the market pulp product types included in the product category are in Table 1. The included product categories are based upon the Central Product Classification (CPC) system.

Table 1. Market pulp types[4] included in the product category, by CPC code.

32112 (Chemical wood pulp, other than dissolving grades)*
32113 (Mechanical wood pulp; semi-chemical wood pulp; pulps of fibrous cellulosic material other than wood)*.

**Recycled pulp is included in these categories.*

For this PCR module, the paper product types included in the product category are in Table 2.

Table 2. Paper types included in the product category, by CPC code.

3212 Newsprint, hand-made paper and other uncoated paper and paperboard of a kind used for graphic purposes, and punch card stock and punch tape paper	3215 Corrugated paper and paperboard and containers of paper and paperboard
3213 Toilet tissue stock, uncoated kraftliner and other uncoated paper and paperboard; misc. other papers	3219 Other paper and paperboard products
3214 Processed paper and paperboard*	32149 Other paper and paperboard, cellulose wadding and webs of cellulose fibers, coated, impregnated, gummed or adhesive, covered, surface-colored, surface decorated or printed in rolls or sheets
322 Books, brochures and leaflets (except advertising material) printed, printed maps; music, printed or in manuscript	325 Stamps, check forms, banknotes, stock certificates, postcards, greeting cards, advertising material, pictures and other printed matter

**This includes printing, magazine and writing papers.*

[4] CPC Ver. 2. http://unstats.un.org/unsd/cr/registry/docs/CPCv2_structure.pdf

6.3 System Boundaries

For EPDs, the system boundary for the LCA can be cradle-to-gate for market pulp or paper products, or cradle-to-grave. For all EPDs, the following life cycle stages shall be included:

- Logging and forest management and associated processes (see PCR Module for Roundwood).
- Primary Processing of roundwood.
- Raw material extraction and processing of pulp made from fibrous cellulosic material other than wood (e.g., on-purpose crops, agricultural residues).[5]
- Collection of wastepaper.
- Processing (e.g., deinking, cleaning) and sorting of wastepaper for recycling.
- Transportation.
- Internal material handling at mill (e.g. transportation of inputs, warehousing and use of vehicles such as forklifts).
- Pulp production (e.g. on-site de-barking and chipping, pulping process, refining, screening, cleaning, bleaching, drying and storage of pulp) and supporting activities.
- Treatment and any off-site transport of waste generated (e.g. sludge from virgin or recycled pulp production);
- Production of coating, filler, bleaching agents, and other ancillary materials.

The emissions avoided as a result of the diversion of recycled wastepaper from landfill shall be calculated based on requirements in Section 6.3.1.

For cradle-to-gate EPDs of paper products, the following life cycle stages shall also be included:

- Paper production (including all steps involved in the paper type, e.g., coating, calendaring, sheeting).
- For printed products: Printing of paper.

[5] The current version of the LCIA Methodology document (December 2015) which supports this PCR does not include specifications for assessment of these products. In the future, PCR Modules for production of other types of fibrous cellulosic material should be developed. LCAs and EPDs for these products shall be assessed only when this PCR Module is developed.

For cradle-to-grave EPDs of paper products, the following life cycle stages shall also be included in addition to life cycle stages described above:

- Distribution and use of pulp and paper products. Paper products shall be assumed as a default to have half-life values described in the table below. If more specific data on use is available, it shall be included. Paper products are assumed not to decay or be combusted while in use.

Table 3. Half-life values for use in estimating time spent in use phase of products.

Category	**Half-life in Use Phase**	**Product Category and CPC Code (see Section 6.2).**
Short Lived Products	2 weeks	• 3212 Newsprint, hand-made paper and other uncoated paper and paperboard of a kind used for graphic purposes, and punch card stock and punch tape paper • 3213 Toilet tissue stock, uncoated kraftliner and other uncoated paper and paperboard; misc. other papers • 3214 Processed paper and paperboard* • 32149 Other paper and paperboard, cellulose wadding and webs of cellulose fibers, coated, impregnated, gummed or adhesive, covered, surface-colored, surface decorated or printed in rolls or sheets • 3215 Corrugated paper and paperboard and containers of paper and paperboard • 3219 Other paper and paperboard products
Long Lived Products	2 years	• 322 Books, brochures and leaflets (except advertising material) printed, printed maps; music, printed or in manuscript • 325 Stamps, check forms, banknotes, stock certificates, postcards, greeting cards, advertising material, pictures and other printed matter

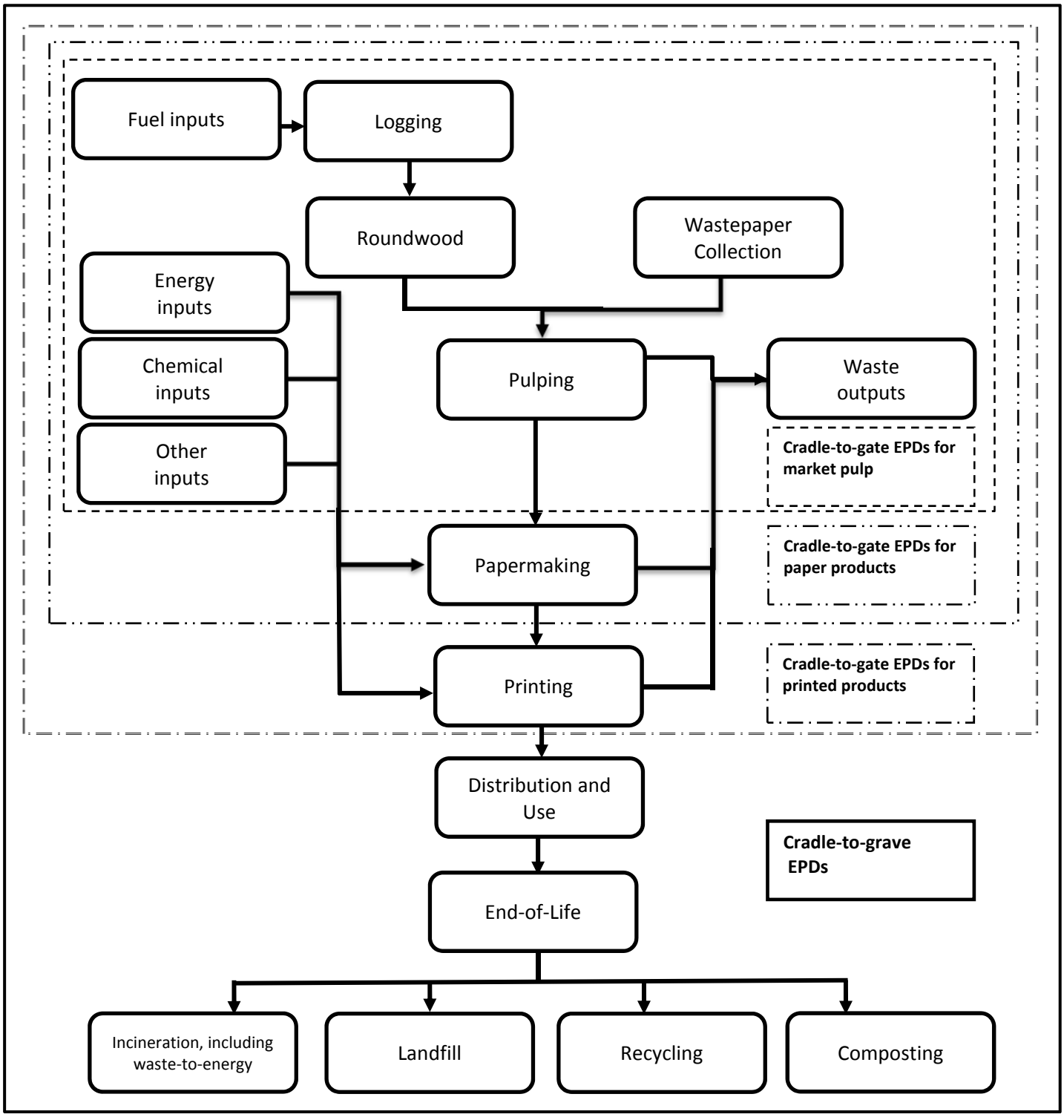
**This includes printing, magazine and writing papers.*

- End-of-life management of pulp and paper products including transportation of waste materials to recycling, incineration, composting or landfill facilities. Default national average assumptions and values will be used to evaluate emissions associated with this stage.

The scope does not include employee transportation and production of logging equipment.

NOTE: The resulting impact level of these unit processes compared to other life cycle stages in roundwood production are very small. Exclusion of these stages from the scope does not affect results materially.

Figure 1 illustrates the life cycle stages to be included in cradle-to-gate and cradle-to-grave EPDs.



188 **Figure 1. System boundary diagram specifying life cycle stages to be included in cradle-to-gate and cradle-to-grave EPDs.**

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There are two types of LCAs and EPDs allowed:

- Product-specific LCAs and EPDs, which consider production of market pulp or paper products at a single mill. The fiber basket for product-specific LCAs and EPDs is the region supplying pulp to this mill.

- Industry-wide LCAs and EPDs, which represent typical industry practices across at least three mills. The fiber baskets for industry-wide LCAs and EPDs are defined separately for each mill in the scope, and for each include the region supplying pulp to this mill. The mills included in the scope must cover a representative sample of the market which is considered.

The LCA and EPD shall assess all life cycle stages based on present conditions, using the most recent data available. Product-specific LCAs and EPDs can also be presented which show changes against a historical baseline condition, which can be no more than 10 years in the past.

6.3.1 Special Considerations for Calculation of Avoided Impacts from Diversion of Recycled Wastepaper from Landfill

The following landfill emissions shall be considered**:** carbon dioxide (CO_2) and methane (CH_4) emitted during decomposition in the landfill (assuming 50% of carbon is converted to CO_2, and 50% to CH_4); CO_2 and methane CH_4 emitted during flaring and combustion. These emissions are attributed to the diversion of recycled wastepaper as an offset, calculated as described in Equation 1.

Equation 1. Calculation for inventory for avoided CO_2 and CH_4 from landfill. (A) is the avoided CO_2, in metric tons, (B) is the avoided CH_4, in metric tons. In both equations, C is the total mass of carbon in the wastepaper diverted from landfill and used for producing recycled pulp (in metric tons), while CH_4 Combustion Fraction is the fraction of methane combusted at the landfill site. 44/12 and 16.04/12 are respectively the molar mass ratios of CO_2 and methane CH_4 to elemental carbon.

$$(a)\ \ Avoided\ CO_2 = C \times 0.5 \times \frac{44}{12} \times (1 + CH_4\ Combustion\ Fraction)$$

$$(b)\ \ Avoided\ CH_4 = C \times 0.5 \times \frac{16.04}{12} \times (1 - CH_4\ CCombustion\ Fraction)$$

The inventory for avoided CO_2 and CH_4 from landfill shall be treated identically to emissions, but as an offset (i.e., are included in the inventory as negative emissions). These are avoided CO_2 and CH_4 emissions.

The following considerations apply to calculation of Equation 1:

- The carbon in the wastepaper diverted from landfill only includes the wastepaper used in the pulping process.

- The CH_4 combustion fraction shall be based upon regional averages within the recycled fiber basket, considering penetration of landfill gas energy and flaring projects. As a default, a combustion fraction of 45% shall be assumed.

NOTE. This combustion fraction is based on the conservatively high estimate of methane capture of 75% in landfills in which collection is in place, and 60% penetration of collection technology[6].

6.4 Data quality requirements

Must follow the Roundwood PCR Module. There are no additional guidance or requirements.

6.5 Rules and Guidance for Life Cycle Assessment

The requirements of ISO 14044, LEO-S-002, and N505 ballot all apply. The requirements and guidance in Section 6.5 are specific to Market Pulp and Paper production, and serve to ensure comparability of EPD results (where applicable) and minimize data collection efforts.

6.5.1 Annual Unit of Analysis and Timeframe of Analysis

6.5.1.1 Market Pulp and Unprinted Paper Products

Market pulp and unprinted paper are an intermediate product for which the function for the whole life cycle is not specified in this PCR, due to their potential use in multiple applications. A unit of analysis (which can also be referred to as a declared unit) is instead used.

This PCR also specifies a timeframe of analysis in order to capture all temporal aspects of the impacts relevant to market pulp and unprinted paper production. This timeframe of analysis sets temporal boundaries for the LCA. The unit of analysis is defined on a year-by-year basis within the timeframe of analysis, and so is referred to as the "annual unit of analysis."

For all LCAs of market pulp conforming to this PCR, the annual unit of analysis shall be the production of a given mass of pulp, which should be at least 1,000 tons of pulp, and the timeframe of analysis shall consider a timeframe of analysis of at least 20 years, and at most 100 years. For EPDs, the annual unit of analysis shall be the production of 1,000 tons of pulp, with results reported at intervals of 20 years, from 20 to and 100 years (i.e., 5 results reported over time). The EPD shall also include in supporting materials results across the entire time period of 20 to 100 years. The market pulp included shall be saleable [10% of moisture] pulp grade, and the LCA report and EPD shall specify the following quality parameters: preconsumer recycled content; postconsumer recycled content; brightness; softwood content on an air-dried metric ton basis; hardwood content on an air-dried metric ton basis.

For all LCAs of paper conforming to this PCR, the annual unit of analysis shall be the production of a given mass of paper, which should be at least 1,000 tons of paper, and the timeframe of analysis shall consider a timeframe of analysis of at least 20 years, and at most 100 years. For EPDs, the annual unit of analysis shall be the production of 1,000 tons of pulp, with results reported at intervals of 20 years, from

[6] EPA Landfill Methane Outreach Program: https://www3.epa.gov/lmop/faq/lfg.html

20 to 100 years. The EPD shall also include in supporting materials results across the entire time period of 20 to 100 years. The LCA report and EPD shall specify the following quality parameters: preconsumer recycled content; postconsumer recycled content; paper weight; brightness; basis weight; bulk/caliper; whiteness; gloss; color opacity; bleaching method (e.g., PCF, ECF); strength.

NOTE. Comparisons cannot be made between sources of market pulp or unprinted paper unless their quality parameters are similar enough that the products can be substituted.

The scope of all LCAs under this PCR shall consider the annual unit of analysis (which can vary over time) produced over the timeframe of analysis.

6.5.1.2 Printed Paper Products

Printed paper products (e.g, books, magazines), can be included in cradle-to-grave LCAs and EPDs. These products can still be used in a variety of applications, each with differing functional requirements. This PCR does not define a functional unit for these products, but instead an annual unit of analysis, as with market pulp and unprinted paper products.

For all applications of LCA according to this PCR, the annual unit of analysis shall be the production of a given mass of printed paper product, which should be at least 1,000 tons. For EPDs, the annual unit of analysis shall be the production of 1,000 tons of printed paper. For applications of printed paper products, the LCA report and EPD shall specify the following quality parameters: planned use of the product; amount of information contained; any other relevant parameters.

As with market pulp and unprinted paper, a timeframe of analysis is also defined, which sets temporal boundaries for the LCA. All LCAs shall consider a timeframe of analysis of at least 20 years, and at most 100 years. For EPDs, the annual unit of analysis shall be the production of 1,000 tons of pulp, with results reported at intervals of 20 years, and 100 years. The EPD shall also include in supporting materials results across the entire time period of 20 to 100 years. The scope of all LCAs under this PCR shall be the unit of analysis produced annually over the timeframe of analysis.

NOTE. The 20 year and 100 year timeframes were selected to detect changes occurring in forest systems as a result of different forest management practices, changes which are not perceptible for at least 20 years in most forest ecosystems. Although the uncertainty associated with impacts over a 100 year timeframe is high, this timeframe captures the long rotation cycles of different forest types and accommodates forest systems that take a longer time to regenerate after logging.

NOTE. This prevents comparisons being made between printed paper products unless all functional characteristics are equivalent (i.e., products can be substituted for one another).

NOTE. Comparisons to other mediums satisfying the same function as certain printed materials (e.g., electronic readers and books) can only be made in LCAs which provide a functional equivalency between these products.

NOTE. Although EPDs under this PCR do not include a functional unit based on use, it is possible to create LCA studies conforming to this PCR which provide equivalencies in order to make these comparisons.

6.5.2 Criteria for the exclusion of inputs and outputs

Must follow the Roundwood PCR Module. There are no additional guidance or requirements.

6.5.3 Data Requirements

For cradle-to-grave LCAs and EPDs for paper products, the half-life of products in use shall be factored in to determine when, and at what rate, emissions occur during end-of-life.

Other data requirements must follow the Roundwood PCR Module. There are no additional guidance or requirements except for those regarding definition of Forest Analysis Units (FAUs).

6.5.3.1 Defining Forest Analysis Units within the Fiber Basket

For pulp/paper production from roundwood sources, results in many impact categories are affected by disturbances to forest ecosystems. This includes: Wood Resource Depletion; Global Climate Change; Ocean Acidification; all impacts in Terrestrial & Freshwater Ecosystems Impacts (from land use). These impacts result from alterations in the forest ecology, with ensuing effects on biomes, species populations and habitats, and levels of stored biogenic carbon. In order to make assessments practical, representative areas must be chosen for analysis where data can be collected on local forest conditions. These representative areas are Forest Analysis Units (FAUs).

An FAUs is an area which is representative of forest ecosystem impacts resulting from forestry operations within the fiber basket. In the comparison of different pulp/paper products, different fiber baskets are defined, and current forest ecosystem conditions and trends in forest conditions are analyzed. The differences in the current conditions and trends in conditions are compared and serve as the basis of the analysis.

All requirements of Section 6.5.3.1 of the Roundwood PCR Module apply in defining FAUs. In addition, in defining FAUs for a single pulp/paper mill, the following requirements apply:

- The FAUs must cover areas which supply at least 20% of the wood fiber to the pulp mill.
- If data on the specific fiber sources to the mill are not available, then the FAUs included must account for at least 20% of roundwood production in forests within 150 miles of the mill.
- The FAUs shall be representative of the logging practices and forest conditions present in the entire fiber basket.

All requirements of Section 6.5.3.1 of the Roundwood PCR Module apply in defining Forest Trend Monitoring (FTM) plans for FAUs.

6.5.4 Streamlining Data Collection

To assess indicator results for market pulp and paper production requires collection of data of many types. This will require a mix of primary data sources and secondary data sources. In order to minimize the required effort, data collection efforts should be focused on those data points related to life cycle stages which are the main contributors to final LCA results.

To ensure that the data quality achieved is the highest possible, with the minimum of required effort, requires an iterative approach to the LCA, following these general steps:

- At the LCA study outset, readily available data should be collected for the operations within the system boundary. This includes collection of primary data which can be accessed very easily, which should be supplemented with secondary data as needed. This easily available data is not intended to serve as sole basis of final results, but rather to identify where further data collection is required.

- For the “core” impacts defined in Table 6 with multiple potential category indicators, distinct impacts shall be identified and listed out separately.

- Preliminary LCA results should then be assessed.

- The key unit processes should be identified, by category indicator, for the preliminary LCA results.

- Data points related to the key unit processes should be updated with primary data. Collection of this primary data should focus on those data points of highest relevance to final results. This relevance should be determined using a contribution analysis, identifying the main contributors to each indicator result. Prior to contacting specific suppliers, publicly available data sources should first be reviewed to see if primary data is readily available.

- LCA results should be assessed using the newly collected primary data.

- The margin of error should be estimated for these LCA results using the guidance and requirements of Section 6.4. If the margin of error is suitable to achieve the goals of the LCA study, then data collection can cease.

- Subsequently, if necessary, additional iterations should be completed, improving the quality of data points related to the key unit processes, as needed, until the margin of error is constrained to a level meeting the goals of the study.

Additional guidance for assessing this LCA, specific to distinct category indicators, is provided in the LCIA Methodology Document.

6.5.5 Allowed allocation procedures

Allocation of multi-output and multi-input processes shall be based on physical properties such as mass or volume, except for special requirements for allocation for the process steps in Table 4. Other allocation approaches (e.g. economic-based allocation) can be explored using sensitivity analysis.

Table 4. Life cycle stage, potential useful co-products, and allowable allocation method.

Life Cycle Stage	Potential Useful co-products	Allocation method
Pulp Production	Pulp of different types and grades Landfill cover, animal bedding, mulch, etc.	All impacts shall be allocated to pulp production. When pulp of different types and grades is produced, impacts shall be allocated based on mass of produced pulp.
Papermaking	Papers of multiple grades Trim and scrap	All impacts shall be allocated to paper production. Impacts allocated based on mass of produced paper product, irrespective of grade of paper product.

6.5.6 Impact Assessment

The LCIA shall be based upon the LCIA Methodology Document. The core impact categories which must be considered are summarized in Table .

7 Content of EPD

7.1 General information

All of the general information required by the Roundwood PCR Module to be included shall be reported in the EPD. In addition, the following information shall be included in the EPD:

a) The location of the mill(s) included in the EPD (on the front page).

b) For EPDs for market pulp products, specification of pulp product category (see Table 1), as well as the quality parameters defined in the functional unit (see Section 6.5.1).

c) For EPDs for paper products, specification of the paper product category according to Table 2, as well as the quality parameters defined in the functional unit (see Section 6.5.1).

7.2 Reporting Requirements for Indicators included

The LCA results shall be included in a prominent place in the EPD. Results shall include the applicable indicator(s), using the allowed units of measure, described in Section 7.2 of the Roundwood PCR Module, supplemented with those described in Table 5. Those category indicator results which require spatially explicit LCIA are noted, calculated according to the approach in the LCIA Methodology document. Additionally, for some impact categories, conditions will worsen over time as the effect of stressors accumulate. Metrics specified in the LCIA Methodology Document reflect the accumulation of impacts over the time horizon considered.

Table 5. Impact categories and category indicators relevant to market pulp and paper production, as well as whether assessment of each requires spatially explicit LCIA and if the impact is accumulated.

Impact Categories by Group	Applicable Indicator(s)	Requires Spatial LCIA	Accumulated Impact
Ocean Ecosystem Impacts			
Persistent, Bioaccumulative, and Toxic Chemical Loading	Mercury Emissions	No	Yes
Terrestrial/Freshwater Ecosystem Impacts from Emissions			
Freshwater Ecotoxicity Impact	Dioxin Emissions	No	Yes
Freshwater Ecotoxicity Impact	Other Ecotoxic Substance Emissions	No	Yes
Human Health Impacts (from Chronic Exposure to Hazardous Chemicals)			
Ambient Emission Inhalation Impact	Multiple indicators	Yes	No[7]

Results shall be reported at intervals of 20 years, from 20 to and 100 years, and should be reported for additional years. In EPDs, results shall be provided in a table using the template of Table 6.

Table 6. Required reporting format for EPDs. Additional columns can also be included for results at other timeframes (e.g., 10 years, 30 years, 40 years).

Impact Categories by Group	Units of measure	Result in Year				
		20	40	60	80	100
Ocean Ecosystem Impacts						
Persistent, Bioaccumulative, and Toxic Chemical Loading (Mercury Emissions)	kg Hg eq.	XX	XX	XX	XX	XX
Terrestrial/Freshwater Ecosystem Impacts from Emissions						
Freshwater Ecotoxicity Impact(A)	g. dioxin eq.	XX	XX	XX	XX	XX
Freshwater Ecotoxicity Impact	g. Pb eq.	XX	XX	XX	XX	XX
Human Health Impacts (from Chronic Exposure to Hazardous Chemicals)						
Ambient Emission Inhalation Impact(A)	Dependent on indicator	XX	XX	XX	XX	XX

A. *The results for these impact categories are listed separately by indicator result, reflecting dioxin contamination in each separately affected watershed.*

[7] This impact category only considers the inhalation pathway of human exposure, which is not a cumulative impact due to the short atmospheric residence for most hazardous air contaminants. In special cases, for substances which have residence times in the atmosphere which are longer than over one year in time and which can cause health impacts through inhalation, impacts may need to be accumulated.

7.2.1 Requirements for Industry-Wide LCAs and EPDs

For industry-wide EPDs, all indicator results must be reported as the median value. A range of results must also be presented, based on the 90% confidence interval, or the maximum and minimum of the sample included.

7.2.2 Requirements for Applications other than EPDs

If LCA results for a paper product are included on a product label and this PCR is referenced as the underlying methodology, results for all impact categories shall be made publicly available through materials available, for example, on a company website. For on-product labels with limited space, the following reporting requirements apply:

- Results for Global Climate Change, Ocean Acidification, Terrestrial Disturbance, Freshwater Disturbance, and Threatened Species Habitat Disturbance shall be reported. Results can be reported according to the guidance and requirements for industry-wide EPDs (see Section 7.2.1).

- A link to the webpage containing the full set of results for all impact categories will be provided alongside the results.

7.3 Disclaimers

In addition to all of the disclaimers from the Roundwood PCR Module, for cradle-to-gate EPDs for market pulp or paper products, the following statement shall be provided in the EPD near where the results are provided:

— "*EPDs developed under this PCR Module can only be compared if the products covered can be used in an identical fashion, and are intended for the same use and disposal.*"

7.4 Additional Environmental Information

The optional additional information which is allowed is described in the Roundwood PCR Module.

8 Special Critical Review Requirements for the LCA

There are no critical review requirements in addition to those contained in the Roundwood PCR Module.

9 Verification and Validity of an EPD

EPD verification shall follow ISO 14025. EPDs are valid for a three year period. During the three year period, an EPD shall be updated to account for any changes that affect the content or accuracy of the EPD. A change in results of +/- 10% should be reported to the verifier and the EPD may need to be updated.

10 Informative References

Life Cycle Assessment of Reincarnation 100 Coated Freesheet Paper, Compared to Virgin Paper Baseline. October 8, 2015. Prepared by SCS Global Services.[8]

Product Category Rule for North American Structural and Architectural Wood Products Version 1.1 (May 2013), FPInnovations.[9]

Product Category Rules for Market Pulp Version 1 (February 2015), FPInnovations.[10]

[8] https://www.scsglobalservices.com/files/resources/lcs_rpt_reincarnation100_mainbody_100815.pdf

[9] https://fpinnovations.ca/ResearchProgram/environment-sustainability/epd-program/Documents/wood-products-pcr-version-v1.1-may-2013-lastest-version.pdf

[10] https://fpinnovations.ca/ResearchProgram/environment-sustainability/epd-program/Documents/Market%20Pulp%20PCR%20February%202015.pdf