

## EcoLeaf Environmental Label Product Category Rules (PCR)

PCR No.	PCR Title	<b>Flatbed/Sheet-fed Scanner</b>
<b>CA – 01</b>		

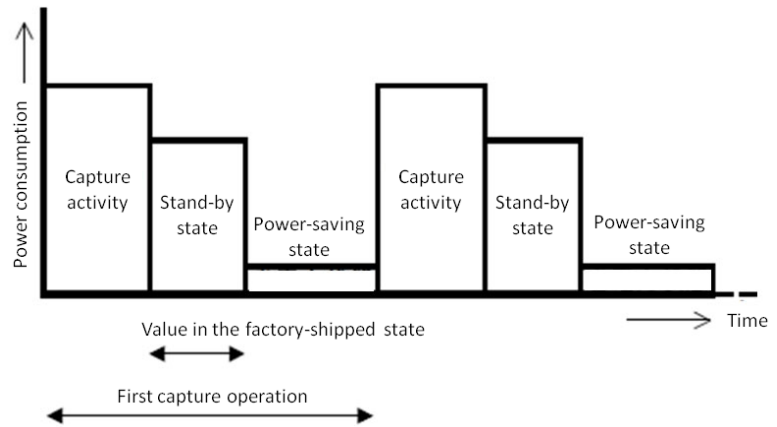
Note: These rules have been prepared for the implementation of the EcoLeaf program. Use for any other purpose in whole or in part without permission is prohibited.

No.	Major key	Minor key	Class	Requirements
1	Pre-requisites for PCR development	Product	Definition	<p>Covered are devices that are commonly used in offices, households, etc., for converting contents that are shown in an original document such as on a piece of paper, into an electronic image (image data) and which capture an original document of approximately A3 or smaller in size. Not included are photo-print scanners (PCR ID. AV).</p> <p>The product categories are:</p> <ul style="list-style-type: none"> <li>· Flatbed scanner: A scanner equipped with a document table.</li> <li>· Sheet-fed scanner: A scanner with a mechanism for moving an original document.</li> </ul> <p>A scanner that is equipped with a document table and possesses a mechanism for moving an original document is to be handled by categorization according to the number of scans per day (estimated based on the design), as follows:</p> <ul style="list-style-type: none"> <li>(a) The number of scans per day is less than 500 scans ··· flatbed scanner</li> <li>(b) The number of scans per day is 500 scans or greater ··· sheet-fed scanner</li> </ul> <p>&lt;See Supplement Figure 1&gt;</p>
2			Scope	<p>The main unit and the following articles (packaging materials and accessories) are covered:</p> <ul style="list-style-type: none"> <li>· All packaging (except for those commonly used repeatedly such as in grouped packaging for transportation)</li> <li>· Accessories cover only those articles for achieving the product's functions, including scanner drivers provided on a floppy disk, a CD-ROM, or the like, manuals on paper or CD-ROM, etc.</li> </ul>
3		Stage	Scope	All lifecycle stages (all stages specified in the PEIDS of this program: production, distribution, use, and disposal/recycling)
4	Product Data Sheet (PDS)  (LCI input data)	Production Stage Information (Product information)	Product Materials or Raw Materials Constitution	<p>1) Parts handled as Parts and Similar A (parts for which processing and assembly burdens are assessed by the company itself) The capture unit is to be handled as Parts and Similar A. The CIS is to be purchased, and, while the CIS may not have to be handled as Parts and Similar A if its production burden data are difficult to collect, the burden is to be entered into the calculation using the EcoLeaf base unit for "mounted circuit board". &lt;See Supplement Figure 2&gt;</p> <p>2) Material category names to be listed in the product data sheet The material names to be listed in the product data sheet are the following 11 items: ordinary steel, SUS, aluminum, other metals, thermoplastic resin, thermosetting resin, rubber, glass, paper, semiconductor substrate and wood. For those that are outside of these eleven items, the base unit names are to be listed.</p> <p>3) Resource input amount To be calculated in terms of mass of materials which have reached the product stage. However, as a special case in which some of the components cannot be ascertained, if the materials for 90% or more of the total product mass can be categorized by types, the remainder may be prorated and converted into a percentage.</p> <p>4) When open recycling/reuse is to be included Entry into the calculations is possible by setting up a scenario considered appropriate at each company while paying attention to the items below. The soundness of the set up basis is subject to verification.</p> <ul style="list-style-type: none"> <li>(1) Processes that fall in the scope of "indirect impacts".</li> <li>(2) Deductions and burdens within the scope of "indirect impacts".</li> </ul>
5			Production stage information (Production site information)	Materials and energy that are input / consumed / disposed of

				<p>In principle, transportation burdens for the input materials (raw materials and energy) are not entered into the calculation. However, if the assembly and the tuning of the "capture unit", which is handled as Parts and Similar A, are performed at multiple sites, the transportation of the relevant parts between the sites is to be entered.</p> <p>4) Byproducts and sub-materials Not to be entered into the calculations.</p> <ul style="list-style-type: none"> <li>· Byproducts designate products that are generated in a production process separately from the product that is produced as its main objective, and are sold with a value.</li> <li>· Sub-materials designate materials that are input and discarded at manufacturing sites, and not shipped with products.</li> </ul>
6		Distribution stage information	Product transportation conditions	<p>1) Transportation from the origin of production to sales bases Means and loading factors are based on models established by each applicant company.</p> <p>2) Total domestic transportation distance Quantification to be done with 500 km.</p> <p>3) Product transportation burden from overseas to Japan For the product transportation burden from overseas to Japan, the land, sea or air transportation burden from the production site is to be entered into the calculations, and the total distance figure is to be set by each company.</p> <p>4) Disposal/recycling of the main unit packaging To be entered into the calculations in No. 8 "Disposal/Recycling".</p>
7		Usage stage information	Product usage conditions	<p>1) Usage conditions For Flatbed Scanners</p> <p>(1) Flatbed scanners (not equipped with a mechanism for moving the original document)</p> <ul style="list-style-type: none"> <li>· Usage is 4 days per month at 2 scans (pre-scan + actual scan) × 10 original documents consecutively per day.</li> <li>· Number of days used per year: 48 days (the number of operating days per year is calculated as 1 day per week × 4 weeks × 12 months = 48 days)</li> </ul> <p>(2) Flatbed scanners (equipped with a mechanism for moving the original document)</p> <ul style="list-style-type: none"> <li>· Usage is 20 days per month with 1 scan (actual scan) × 50 original documents consecutively per day</li> <li>· Number of days used per year: 240 days (the number of operating days per year is calculated as 5 days per week × 4 weeks × 12 months = 240 days)</li> </ul> <p>Matters common to (1) and (2)</p> <ul style="list-style-type: none"> <li>· A reference original document is to be established at each company.</li> <li>· An original document of A4 size in vertical orientation is to be captured in color at a resolution of 300 dpi.</li> <li>· Duration of use per day: 8 hours</li> <li>· Period of use: 5 years</li> <li>· Not to be energized unless under use. (Power sources, such as power cords, are to be unplugged)</li> <li>· The transition time from the stand-by state to the power-saving state is to be the value taken in the factory-shipped state.</li> <li>· Measurements for products powered by a standard low voltage DC power source is to conform to the note below, as stated in "ENERGY STAR<sup>(R)</sup> Qualified Imaging Equipment Test Procedure Final Draft" issued on August 31, 2005, from the "ENERGY STAR<sup>(R)</sup> Qualified Imaging Equipment Operational Mode Test Procedure":</li> </ul> <p>Note: Products powered by a standard low voltage DC supply (e.g., USB, USB PlusPower, and Power Over Ethernet) shall utilize a suitable AC-powered source of the DC power. For an imaging equipment powered by USB, a powered hub serving only the imaging equipment being tested shall be used. For an imaging equipment powered by Power Over Ethernet or USB PlusPower, it is acceptable to measure the power distribution device with and without the imaging product connected, and use the difference between the two as the imaging product's consumption.</p> <p>For sheet-fed scanners</p> <ul style="list-style-type: none"> <li>· For the number of sheets captured and the number of transitions to power-saving state, the applicant devices are to be classified into the categories of the following table, and the conditions of those categories are to be used:</li> </ul>

Category	Low speed 1	Low speed 2	Medium speed 1	Medium speed	High speed
Capture speed (from over Xppm to Yppm at most)	0 to 25	25 to 40	40 to 60	60 to 90	90 and higher
Number of sheets/day	500	4000	8000	12000	20000
Number of transitions to power-saving state/day	25	15	10	5	5
Number of capture operations	20 sheets × 25 times	267 sheets × 15 times	800 sheets × 10 times	2400 sheets × 5 times	4000 sheets × 5 times

- Duration of use per day: 8 hours
- Number of days used per year: 240 days (the number of operating days per year is calculated as 5 days per week × 4 weeks × 12 months = 240 days)
- Period of use: 5 years
- Not to be energized unless under use. (External power sources are to be in an unplugged state)
- A reference original document is to be established at each company.
- Capture is to be performed with: A4 sheet in vertical orientation, in monochromatic binary, single-sided mode, at a resolution of 200 dpi.
- The transition time from the stand-by state to the power-saving state is to be the value taken in the factory-shipped state.



- The operation is to be in the standard state, without operating any function that is not directly related to capture.

2) Quantities of regularly replaced parts and consumables used

Items: Based on the plan at the time of the design, or on actual history.

Quantities: Quantities used over 5 years based on the above, with fractions rounded up to integers.

Transportation: A model based on the above is to be established at each company.

3) Conditions for disposal and recycling of regularly replaced parts and consumables are set forth in No. 8 "Disposal/Recycling".

8		Disposal / recycling stage information	Product disposal / recycling conditions	<p>1) Scenario set up The "End-of-life Product Disposal/Recycling Scenario" on the separate sheet is to be adopted.</p> <p>(1) The recovery routes are to have a scenario set up at each company, including transportation.</p> <ul style="list-style-type: none"> <li>· Reuse scenario</li> <li>· Recycling scenario</li> </ul> <p>Material-specific recycling rates (= <math>\eta</math>) are to be established at each company.</p> <ul style="list-style-type: none"> <li>· Non-reuse/non-recycling industrial waste management scenario</li> </ul> <p>(2) Non-recovery routes are to adopt the "General Disposal Scenario" (see separate sheet).</p> <p>2) Deduction scenario The "End-of-life Product Disposal/Recycling Scenario" on the separate sheet is to be adopted.</p> <p>3) Recyclability and reusability criteria The criteria are to be defined individually at each company.</p> <p>4) Product recovery rate (the same applies to the "part recovery rate" for the consumables and the replacement parts) The value (<math>\eta_1</math>) from an actual history in each company is to be adopted.</p> <p>5) For product reuse N1, the number of times a product is reused after a 5-year usage period, is set based on each company's design values. N1 is an integer. The above N1 is used for the burden calculation: Parts reuse deduction amount = "reusable amount planned at time of design by each company" <math>\times</math> "product recovery rate <math>\eta_1</math>" <math>\times</math> "reuse deduction ratio <math>N1/(N1+1)</math>"</p> <p>6) For consumables and replacement parts N2 is the number of times a target is reused during its lifetime, and n is the number of the targets used in 5 years, with fractions rounded up to integers. The above N2 and n are used for the burden calculation: Parts burden = "burdens until production of one part" <math>\times</math> "number of parts used in 5 years (n)" Parts reuse deduction amount = "reusable amount planned at time of design by each company" <math>\times</math> "parts recovery rate <math>\eta_1</math>" <math>\times</math> "reuse deduction ratio <math>N2/(N2+1)</math>" <math>\times</math> "number of parts used in 5 years (n)"</p> <p>7) Concrete method for entering into the calculations the processing burdens for products or parts that are disposed of without being recycled or reused The "End-of-life Product Disposal/Recycling Scenario" on the separate sheet is to be adopted.</p> <p>8) Open recycling/reuse When open recycling/reuse is to be included, entry into the calculations is possible by setting up a scenario considered appropriate at each company while paying attention to the items below. The soundness of the set up basis is subject to verification.</p> <p>(1) Processes that fall in the scope of "indirect impacts". (2) Deductions and burdens within the scope of "indirect impacts".</p>
9	Product environmental information data sheet (PEIDS)	Inventory analysis	LCI calculation formula	1) When open recycling/reuse is to be included, indirect impacts and direct impacts are to be calculated separately, and among these, the indirect impact portions are to be represented as "recycling effects". In addition, as necessary, the breakdown of the recycling effects is to be listed in the "Notes to Readers" section of the PEIDS.
10		Impact assessment	Category additions	The items "ozone layer destruction" and "eutrophication" are to be removed from the PEIDS.
11	Break-down data sheet	Data processing	Allocation	To be decided suitably, without unifying, at each company.
12	(relevant to)	Data collection	Collection range	If data cannot be obtained with a new product, or the like, data that contain the conditions at the time of design or at the time of planning may be used as substitute.

13	product data sheet)		Cut-off rules	If a cut-off is to be applied to an assembly burden, or others, a clear note to this effect is to be made and the reasons for doing so made clear.
14	Break-down data sheet (relevant to PEIDS)	Database	Base unit database selection	1) Assembly of purchased parts decided by each company > "Parts assembly" 2) Board part and CCD, CIS > "Mounted circuit board" 3) Material of the lamp's light-emitting part > "Glass"  (Note: the above are not meant to limit the use of individual base units.)
15			Base unit database additions	None
16			Characterization factor additions	None
17	Product environmental information	Product specifications		1) Product category (flatbed scanner, sheet-fed scanner) <ul style="list-style-type: none"> <li>For flatbed scanners, presence/absence of a mechanism for moving the original documents to carry out capture (ADF)</li> <li>For sheet-fed scanners, presence/absence of a document table</li> <li>The "Personal use" or "Business use" classification</li> </ul> 2) Capture speed 3) Maximum capture document size 4) Capture resolution 5) Capture method (CIS, reduction optics, etc.) and imaging element (CCD, MOS, etc.)
18		Data publication contents		1) Statements <ul style="list-style-type: none"> <li>The "warming burden", "acidification burden" and "energy consumption amount" are to be entered as compulsory items, while the 5 optional items "mineral resource burden", "energy resource burden", "usage stage electricity consumption", "usage stage water consumption" and "soil waste amount" are to be listed as deemed fit.</li> <li>The following sentence is to be entered in the lower portion of the E section in the PEAD sheet: "The burdens have been calculated with ___ scans per day, a monthly use of ___ days, and 5 years of use, for a number of scans of ___ times overall".</li> </ul> 2) Representation method <ul style="list-style-type: none"> <li>In the E section of the PEAD sheet, the warming burdens (in terms of CO<sub>2</sub>) for each stage and the sum of all the stages are to be represented with a bar graph.</li> <li>If open recycling/reuse is to be included, the "recycling effect" is not to be integrated with the actually generated burdens, and should be represented independently with a dotted line for each stage.</li> </ul>
19	Other environmentally relevant information	Optional items		The following can be entered: <ol style="list-style-type: none"> <li>Type I and/or Type III environmental label</li> <li>ISO 14001 certification acquisition</li> <li>Certifications, accreditations or awards from national or industry organizations</li> <li>Hazardous substance information Can be entered by specifying the relevant part, and for a range of 6 substances: lead, mercury, cadmium, hexavalent chromium, poly biphenyl bromide (PBB) and polybrominated diphenyl ether (PBDE).</li> <li>Eco-conscious material information Can be entered by specifying the part and the name of the material.</li> </ol>

(Note 1) Regarding the terms:

(1) Categorization of raw materials/parts (hereafter: Parts and Similar) being imported to the site

Categorization is to be made into: Parts and Similar A, Parts and Similar B, and Parts and Similar C. For information on their definitions, see the EcoLeaf product data verification documents preparation manual.

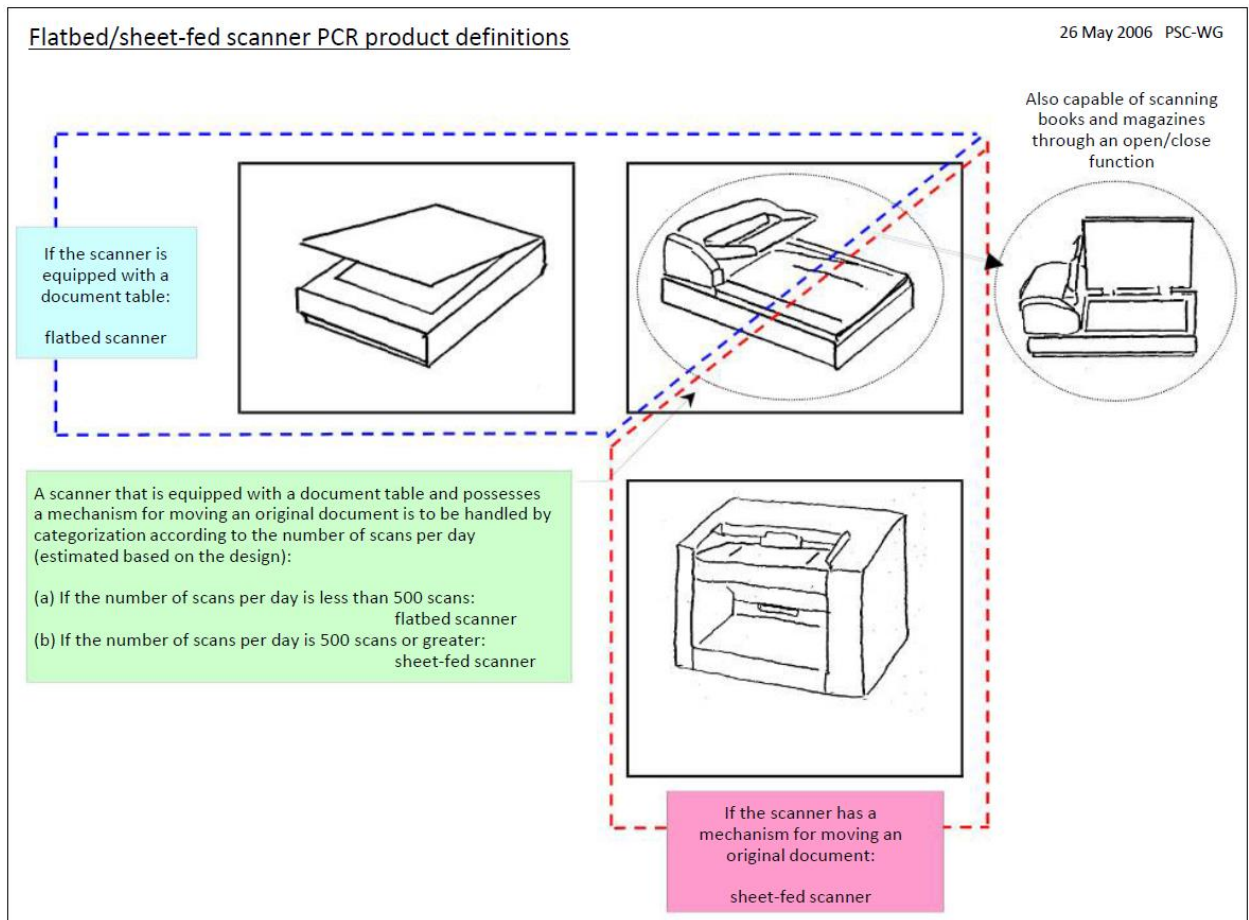
(2) Deduction

Refers to subtracting from the new environmental burdens generated due to recycling and reuse, the environmental burdens accompanying the production of new materials, new parts, etc., that have been reduced.

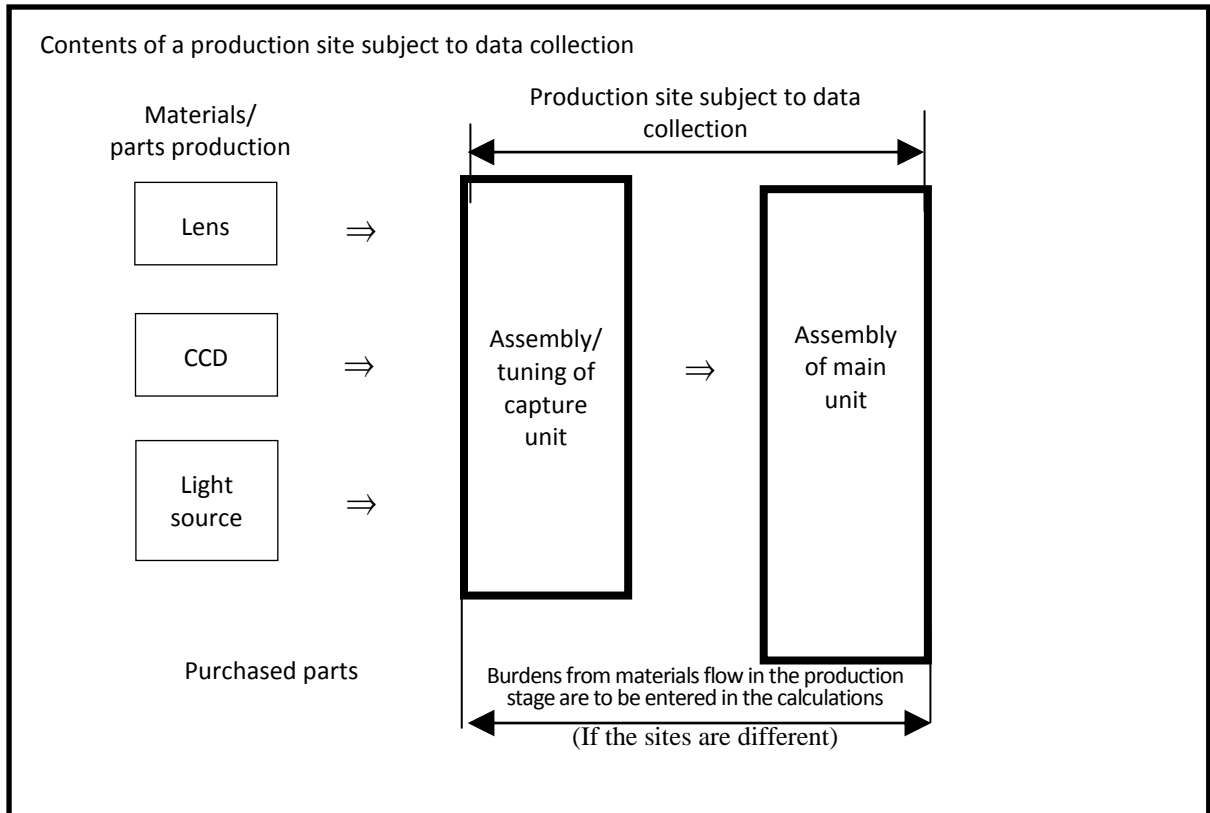
(3) Base unit

See EcoLeaf Quantification Rules, Section 5, 1(2).

<Supplement Figure 1>



<Supplement Figure 2>



**Information on the development/approval of this PCR**

EcoLeaf deliberation commission	Representative: Youji Uchiyama	Affiliation: Tsukuba University, Graduate School	
PCR development/revision date	June 7, 2006	Validity period	February 1, 2014 to January 31, 2017

Note: For the current PCR, the validity period is full 3 years from the development/renewal or revision with the purpose of continuation.

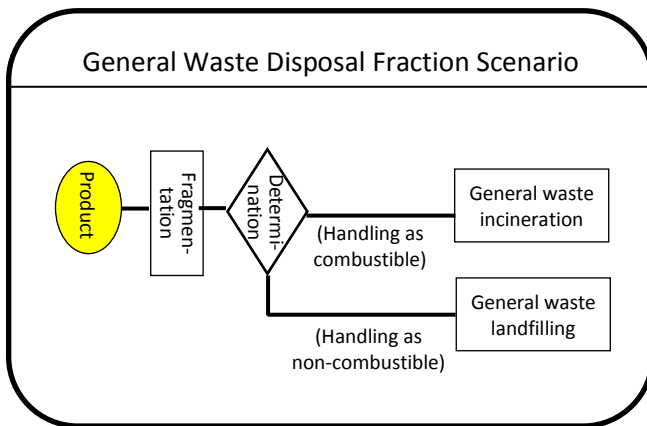
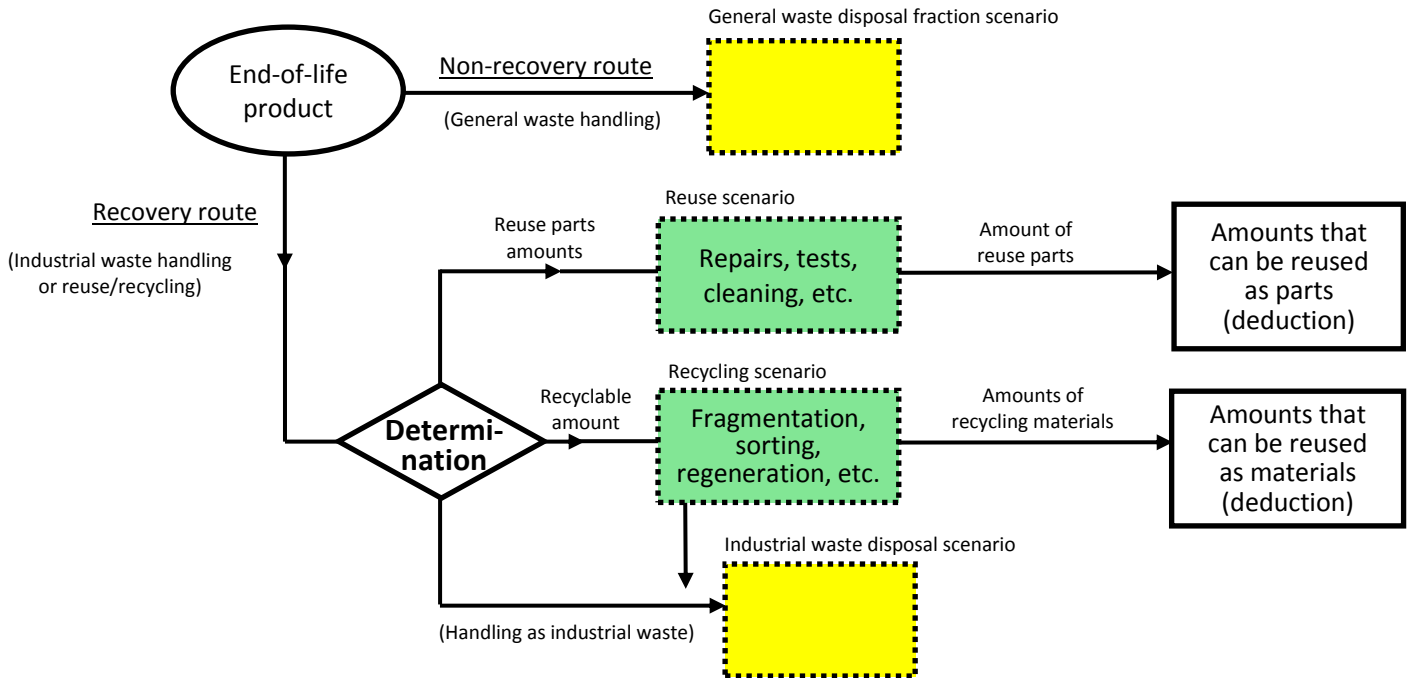
**History of revisions, etc. for this PCR**

Date	Version No., etc.	Action taken
June 7, 2006	01	
February 1, 2011		Updated
February 1, 2014		Updated





# End-Of-Life Product Disposal/Recycling Scenario



"Non-recovery route": route taken if entry into the calculations is made in terms of disposal as general waste (municipalities' responsibility)

"Recovery route": route taken if entry into the calculations is made in terms of disposal as industrial waste (businesses' responsibility) or reuse/recycling