Quantitative Environmental Information Label
(ISO Type III Environmental Declarations)

Guidelines for the Introduction of the ECO-LEAF Environmental Label

First Edition

April 2002

JAPAN ENVIRONMENTAL MANAGEMENT ASSOCIATION FOR INDUSTRY

Introduction

This document provides guidelines for the introduction of a new type of product label called ECO-LEAF, whose purpose is to indicate quantitative environmental information about products and services. This label belongs to the Type III labeling category defined by the International Organization for Standardization (ISO TR 14025).

In September 1998, the Japan Environmental Management Association for Industry (JEMAI), with support from the Japanese Ministry of Economy, Trade and Industry, began developing a program for Type III environmental declarations. It studied the feasibility of this new type of label by introducing trial programs in May 1999 and June 2000. The trial phase was completed in June 2001, and the full-scale ECO-LEAF program is now ready to begin.

The Diet enacted a basic law in 2000 to promote a recycling-oriented economy and society. One aim of the new law is to promote an eco-conscious lifestyle among the populace through the proliferation of environment-friendly products and services. The ECO-LEAF program is one strategy for achieving this.

The guidelines provided in this document form the basis of the ECO-LEAF program. They set forth procedures for obtaining and verifying useful quantitative environmental data for manufacturers and distributors who register an ECO-LEAF label.

JEMAI is continually improving and developing the ECO-LEAF program. It plans to introduce eco-efficiency indicators on labels and to implement mutual recognition with other countries so as to ensure international conformity. The ECO-LEAF program will thus benefit those who are striving to develop environment-friendly products and service.

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Chapter 1 Objectives and Characteristics of the ECO-LEAF Environmental Label

1.1 Objectives

The ECO-LEAF environmental label is designed to present information about the environmental impact of a product or service without making any judgment about whether the product or service meets any environmental quality standard. It is up to users of products and services to make that judgment on the basis of the information presented. By encouraging companies to provide this information, the ECO-LEAF program aims to encourage them to introduce eco-conscious products and services. This will give users a stronger awareness of eco-conscious practices and allow them to choose and use environment-friendly products and services. By facilitating communication of environmental information between producers and users, the program aims to create a relationship of mutual trust, thereby contributing to the creation of a recycling-oriented society.

1.2 Characteristics

Environmental labels are categorized into three types:

- Type I, in which the use of a certification mark is permitted by a certifying body who makes a judgment based on a certain standard
- Type II, in which a company self-declares that its products are environment-conscious
- Type III, in which quantitative environmental data are disclosed for the life cycle of a product, from raw material extraction to production, distribution, use, disposal, and recycling of a finished product. The Type III environmental labels differ from the other two in presenting quantitative data without a judgment as to the environmental friendliness of the product or service.

In addition to these basic characteristics, the ECO-LEAF program has several unique characteristics:

1) An ECO-LEAF label provides quantified information resulting from evaluation of the environmental impacts of products or services.
2) The data are specified in the environmental labeling standards of the ISO 14020 series and the life-cycle assessment (LCA) methods of the ISO 14040 series.
3) An ECO-LEAF label is obtained through the establishment of product specification criteria, collection of product environmental data, verification of the data, and

registration.

4) The program can recognize and certify the internal system for collecting quantitative product data at the company as well as its effective operation.
5) The objectivity of quantitative data is ensured by qualified verifiers appointed by JEMAI.
6) The ECO-LEAF label is composed of three sets of documents: (1) the product label, which shows a summary of the data, the Product Environmental Aspects Information Declaration (PEAD), and the background data; (2) the Product Environmental Information Data Sheet (PEIDS); and (3) the product data sheet.
7) All ECO-LEAF labels are publicly available on the JEMAI Web page.

Certain aspects of points 1 to 3 are basic characteristics of the Type III environmental declaration specified in ISO TR 14025. Points 4 to 7 are unique to the ECO-LEAF program.

1.3 Functions

Companies adopting ECO-LEAF can make use of the PEAD, PEIDS, and product data sheet in their product brochures, leaflets, specifications, advertisements and so on within the scope of the ECO-LEAF program.

By enhancing information disclosure through labeling and the JEMAI database, the program can:

i) help satisfy consumers' needs to purchase green products and services
ii) allow companies to meet consumers' needs for information and to meet accountability requirements
iii) allow companies to demonstrate the performance of their eco-conscious products
iv) create a foundation to facilitate environment-related communication between consumers and companies.

1.4 Scope of the program

Scope of products: Industrial goods, durable consumer goods, daily necessities, energy such as electricity, buildings, food, and services associated with these products.

Scope of services: Those limited to the processing of the above products.

Participants in the program: Producers, distributors, and agents of product and service providers can introduce the ECO-LEAF label.

Any interested party can propose the establishment of a product specification criterion. Interested parties include producers, retailers of products, service providers and agencies,

purchasers, consumers and users, government administrators, and others directly involved in the program operation.

1.5 Approach to future developments

The ECO-LEAF program is not intended to remain within the scope described in these guidelines. It will be continually improved to ensure better communication between producers or suppliers and users of products and services. In this regard, the program will promote the following two areas of activities.

1.5.1 Study and research on the adoption of an environmental efficiency index

The ECO-LEAF label's basic characteristic is the indication of quantitative data. It is up to users to decide how to interpret and evaluate those data. Users may find this daunting, however; it is not easy even for experts. This highlights a current disadvantage of Type III environmental declaration programs in general. The key challenge is to ensure that the data are comprehensible. One way may be to indicate data in a simplified way, such as an index or rating. However, although methods to convert quantitative data into an index or rating have been developed, none is yet suitable for practical use.

JEMAI plans to study the feasibility of using such an index in the PEAD, on the assumption that the effectiveness of eco-efficiency indicators will gain recognition within a few years.

1.5.2 International conformity

As economic globalization is accelerating, environmental labeling practices must not become trade barriers but become beneficial tools for business. The ECO-LEAF program intends to develop along with such global trends. Specifically, JEMAI actively participates in international standardization activities through ISO to ensure that the ECO-LEAF label conforms to potential international standards regarding environmental declarations. It also promotes cooperation with similar program developers abroad to accelerate mutual recognition. For example, in response to a call made by JEMAI, the GEDNet (Global Type III Product Environmental Declaration Network) was established in 1999 by eight organizations from eight countries, and discussions for mutual recognition have been held.

Chapter 2 Framework of the ECO-LEAF Environmental Label Program

This chapter explains the framework of the ECO-LEAF program—the program structure, the label composition, a summary of the systems and organizational structure designed to maintain and operate the program, and the basic steps to registration.

2.1 ECO-LEAF environmental label program

2.1.1 Program structure

The ECO-LEAF environmental label is characteristically quantitative, objective, transparent, and easily compared with others. The label should be prepared in a fair, accurate, prompt, and economical manner. As the highest priority it must be easy to understand. To meet these requirements, the program has several steps.

Figure 2.1 summarizes the basic structure of the program.

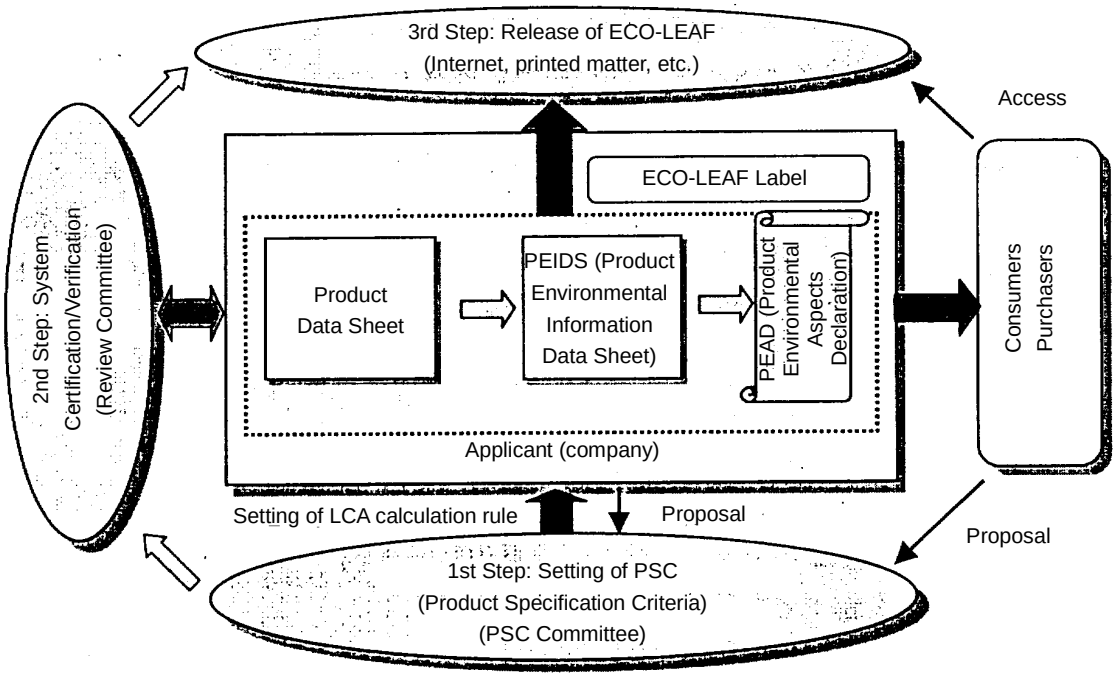


Figure 2.1 Framework of the ECO-LEAF environmental label program

2.1.2 Composition of ECO-LEAF label

ECO-LEAF labels comprise the following three elements:

Product Environmental Aspects Declaration

The PEAD provides representative information on the product, including some environmental data. It should be prepared concisely but in a highly uniform and visual way that product purchasers and consumers can easily understand. Below the main text part, other environment-related information may also be recorded, provided that its accuracy can be confirmed.

Guidance for preparing a PEAD is shown in Section 3.2. A PEAD form (Form 1) is attached to this document.

Product Environmental Information Data Sheet

Detailed information is recorded on the PEIDS to clarify the basis of the PEAD and to summarize the results of inventory analysis, impact assessment, and energy consumption.

Inventory analysis, based on the LCA method, calculates and evaluates the amounts of energy, raw materials, and environmental contaminants associated with a product during its life cycle. Impact assessment correlates the results of inventory analysis with indicators such as the consumption of exhaustible resources and the emission loads that indicate the level of global warming and ozone depletion, enhancing the ease of understanding for the general public.

Guidance for preparing a PEIDS is shown in Section 3.3. A PEIDS form (Form 2) is attached to this document.

Product Data Sheet

The product data sheet records the underlying data used in the preparation of the PEIDS. The company introducing the ECO-LEAF label prepares the product data sheet by describing the inputs and outputs of energy, raw materials, and environmental contaminants per product unit based on actual measurements within its direct range of influence (e.g., within its factory).

Guidance for preparing the product data sheet is shown in Section 3.4. A form (Form 3) is attached to this document.

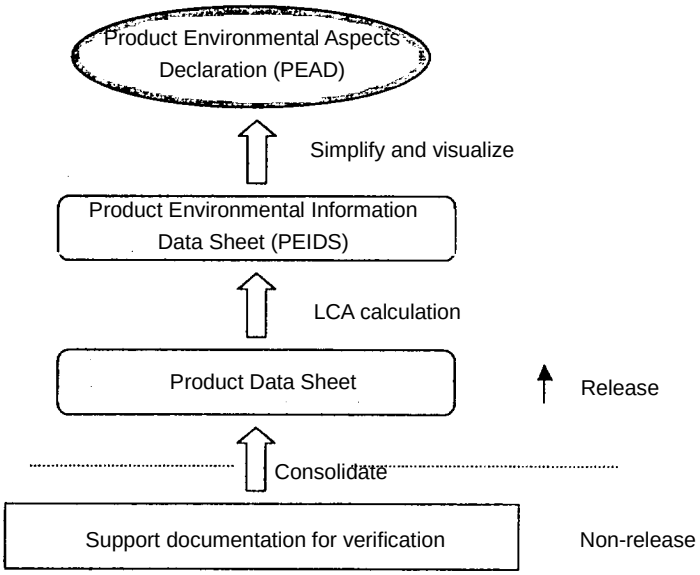


Figure 2.2 Preparation of ECO-LEAF label document

In addition to the above documents, the company introducing the ECO-LEAF label is required to submit supporting documents for verification. The supporting documents are not disclosed to third parties but are used to verify the credibility of the three main documents.

The support documents include a diagram showing the product composition, flowcharts of the product's life-cycle stages and production process, breakdown data sheets, and the calculation sheets used for inventory analysis and impact assessment. For details of the supporting documents, see Section 3.5.

Figure 2.2 summarizes the document structure of the ECO-LEAF environmental label program.

2.2 Systems for preparation of the ECO-LEAF environmental label

To achieve the characteristics outlined in Section 1.2, the program has systems for:

i) product specification criteria
ii) certification of data collection system
iii) data verification
iv) data correction.

Rules or procedures have been established for each of these systems. The program rests on the concepts and methodology of the ISO 14020 series, defining the environmental labeling standards, and the ISO 14040 series, defining the LCA standards.

The four systems comprising the program are shown in Figure 2.3.

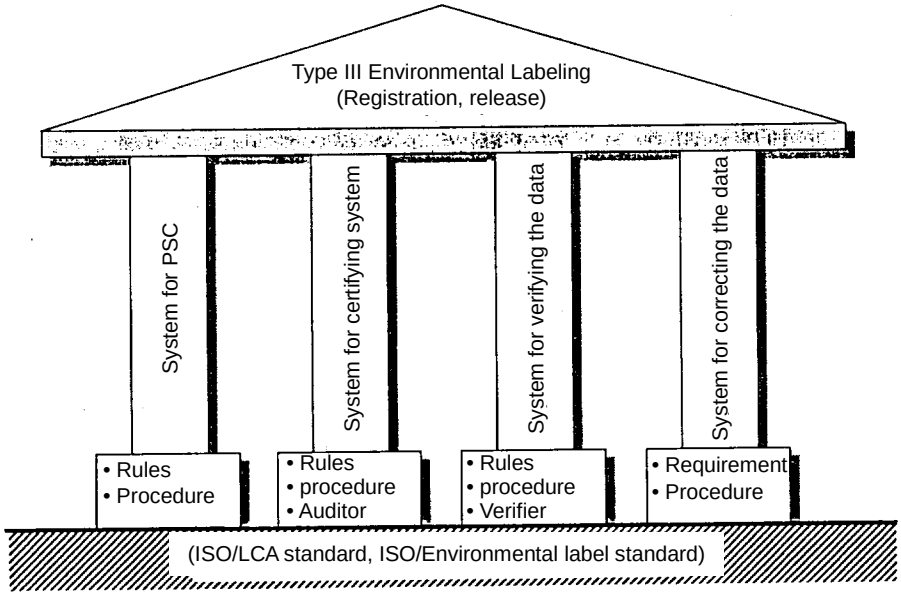


Figure 2.3 Four-system framework of the ECO-LEAF environmental label program

2.2.1 Product specification criteria

To ensure the objectivity and consistency of the information on the label, which allows consumers or purchasers to make a solid judgment, for every product group or category there should be uniformity in the definition of products, the requirements and rules of the LCA calculation, the scenarios of product use and disposal, the methods of data collection, processing and use, and the data to be disclosed.

The product specification criterion (PSC) functions as a criterion by which to set rules for LCA calculations for each product category and as the cornerstone of the ECO-LEAF environmental label program.

A PSC is established following a draft proposal prepared by the PSC working group (PSC-WG) and through discussions by the PSC committee. For the rules and procedures for preparing a PSC, see Section 4.1.

2.2.2 Certification of data collection system

If the company preparing the ECO-LEAF label can show that it has an efficient system for collecting product environmental data and continuous functionality and effectiveness, it can be certified to verify its own data collection. This is called system certification.

Once the company achieves system certification, it can verify collected data internally

(internal verification) and thereby control the preparation of the label.

System certification is granted by system auditors. System auditors must be qualified by JEMAI, have at least the level of knowledge and technical competence required by the ECO-LEAF environmental label program, and be registered as qualified auditors.

For rules and procedures of system certification, refer to Section 4.2. The qualification of system auditors is set forth in Chapter 6.

2.2.3 Data verification

Data verification is the process of confirming whether the LCA study has been appropriately conducted, the data based on the LCA study conform to the PSC, and the label information is exhaustive, accurate, objective, and transparent. Data can be verified either internally or externally.

(1) Internal verification

Internal verification applies to companies that have obtained certification for their data collection system. The company should appoint two internal verifiers, one regular and one deputy, who are independent of the label preparation process. They verify the appropriateness of the environmental data on the label. Internal verifiers are employees or contractors and must be registered as qualified verifiers, as described below. The company can appoint or replace such verifiers at its discretion. Internal verifiers should submit to the ECO-LEAF program office a set of verification documents. The company can then register and release the ECO-LEAF label (see Section 4.3).

An internal verifier must satisfy JEMAI that he or she has at least the level of knowledge and technical competence required by the program and be registered as qualified verifier (see Chapter 6).

(2) External verification

External verification applies to companies whose data collection system has not been certified. The verification standards and the qualification of external verifiers are the same as those for internal verification (see Section 4.3 and Chapter 6). External verifiers should submit to the ECO-LEAF program office the verification result report. The review committee then makes judgment on the report. When the committee approves the report, the company can register and release the ECO-LEAF label (see Section 4.3).

2.2.4 Label registration and release

An ECO-LEAF applicant that has completed all processes and obtained approval can release a label. Section 4.4 summarizes the procedures of registration and disclosure, including the scope of registration, the means of disclosure, the issue of the registration certificate, and the revocation of a registered label. The use conditions and specifications of the registration mark are set forth in Chapter 5.

2.2.5 Data correction

After an ECO-LEAF label is registered, the company can correct the data if necessary. The company should submit a Data Correction Application Form to the ECO-LEAF program office, explaining the reason and procedure concisely. The program office reviews the form and submits it to the review committee for discussion and judgment. The company can correct data on the label after receiving approval from the program office.

Section 4.5 summarizes the procedures for data correction.

2.3 Organizational structure

In order to ensure that an ECO-LEAF label is accurately and fairly prepared, verified, and approved, the program has three committees and one working group. Operational details of these committees and working group are set forth in separate rules.

i) ECO-LEAF environmental label program steering committee (steering committee)
   The steering committee is composed of experts from academia and industry, consumers, and public authorities. The committee makes decisions on the program operation and supervises and evaluates the activities of the PSC and review committees.

ii) PSC committee
   The PSC committee evaluates the PSC proposal prepared by the PSC-WG (described below) and establishes the final PSC. Members of this committee are experts from academia and industry, and consumers who have strong knowledge of environment-conscious products and environmental labels.

iii) Review committee
   The review committee delivers judgment on the result of the certification review conducted by system certified auditors (see Section 2.2.3) or on the result of verification conducted by external verifiers. If any error or doubt is found in the submitted report, the

committee can request supplementary explanation or the resubmission of the report and can even disapprove the report if necessary. The review committee members are LCA experts who have knowledge of ISO environmental labels, and knowledgeable consumers.

iv) PSC working group

The PSC-WG drafts a proposed PSC for the work area designated by the ECO-LEAF program office and submits it to the PSC committee. The PSC-WG is composed of company representatives who have applied for the position in response to an announcement by the ECO-LEAF program office.

For the organizational structure of these committees and working group, see Figure 2.4.

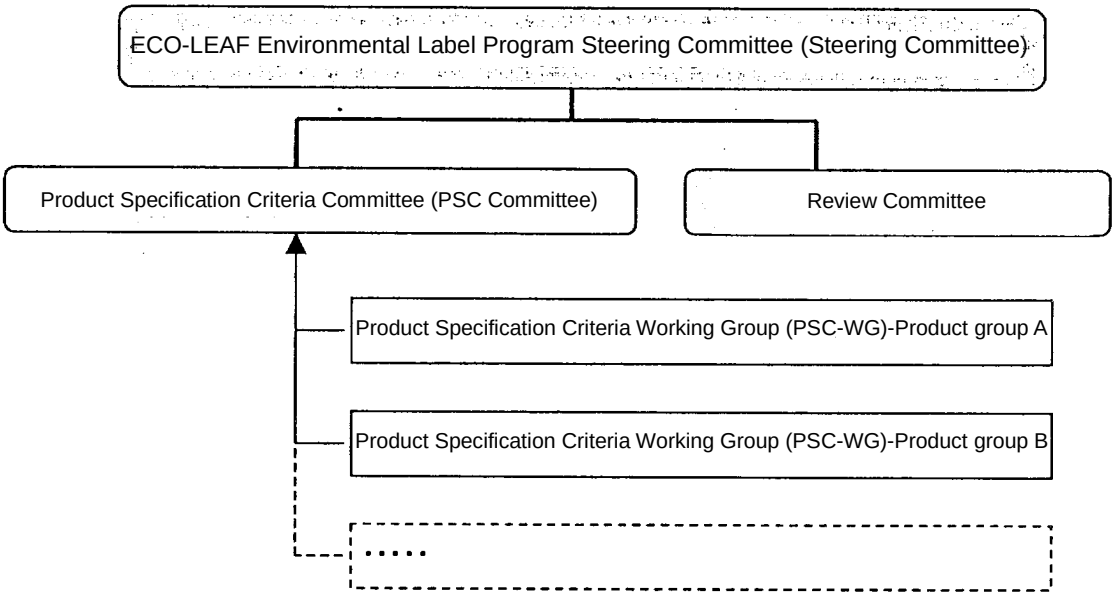


Figure 2.4 Organizational structure of the ECO-LEAF environmental label program

[Reference] Rules of ECO-LEAF environmental label program steering committee
Rules of PSC committee
Rules of review committee

2.4 Basic steps for ECO-LEAF registration

To introduce an ECO-LEAF label, it is necessary to establish the PSC and prepare the label. The former process is unnecessary if a relevant PSC has already been established for the same product category.

2.4.1 Basic flow for establishing product specification criteria

If no PSC has been established for a product category, it is necessary to establish one as shown in Figure 2.5. An application to establish the PSC should be submitted to the program office on a PSC application form. The PSC committee will decide whether the application is acceptable or not. When it is accepted, the ECO-LEAF program office calls for members to organize a PSC-WG that will draft an original PSC. The drafted PSC proposal is submitted to the PSC committee for review. Following this process, the established PSC is open to the public on the JEMAI Web page.

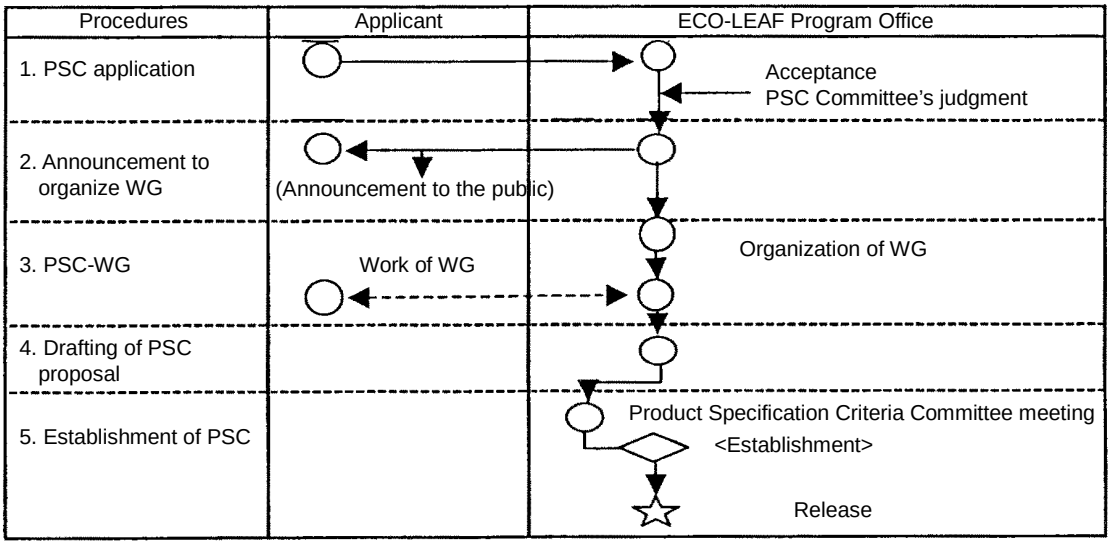


Figure 2.5 ECO-LEAF environmental label program—basic flow diagram from application to establishment of PSC

2.4.2 Basic flow of ECO-LEAF label preparation

The stages from the application for program participation to the disclosure of the ECO-LEAF label, after the PSC has been established or if one is already in place, is shown in Figure 2.6.

The applicant company should submit a verification application form to the ECO-LEAF program office. The program office notifies the company of acceptance and provides it with databases of common basic units and characterization coefficients. The applicant collects and processes data, using these databases to prepare documents for verification.

A company choosing internal data verification should conduct the verification at this stage and then submit a set of documents to the program office for verification. After verification, the company can register and disclose the ECO-LEAF label.

A company choosing external verification should prepare documents for verification on the basis of the LCA result and submit the documents to the program office for verification by external verifiers. The external verifiers should confirm the evidence and conduct on-site inspection if necessary. After verification, the verifiers should submit the verification result report to the program office for approval by the review committee. The ECO-LEAF label can be registered and disclosed when the approval is given.

A company that wants to make its ECO-LEAF label public should apply for registration and disclosure and will be issued with a registration certificate.

The approved ECO-LEAF label is made public by JEMAI on the Internet as well as by the company on the Internet and/or in printed materials.

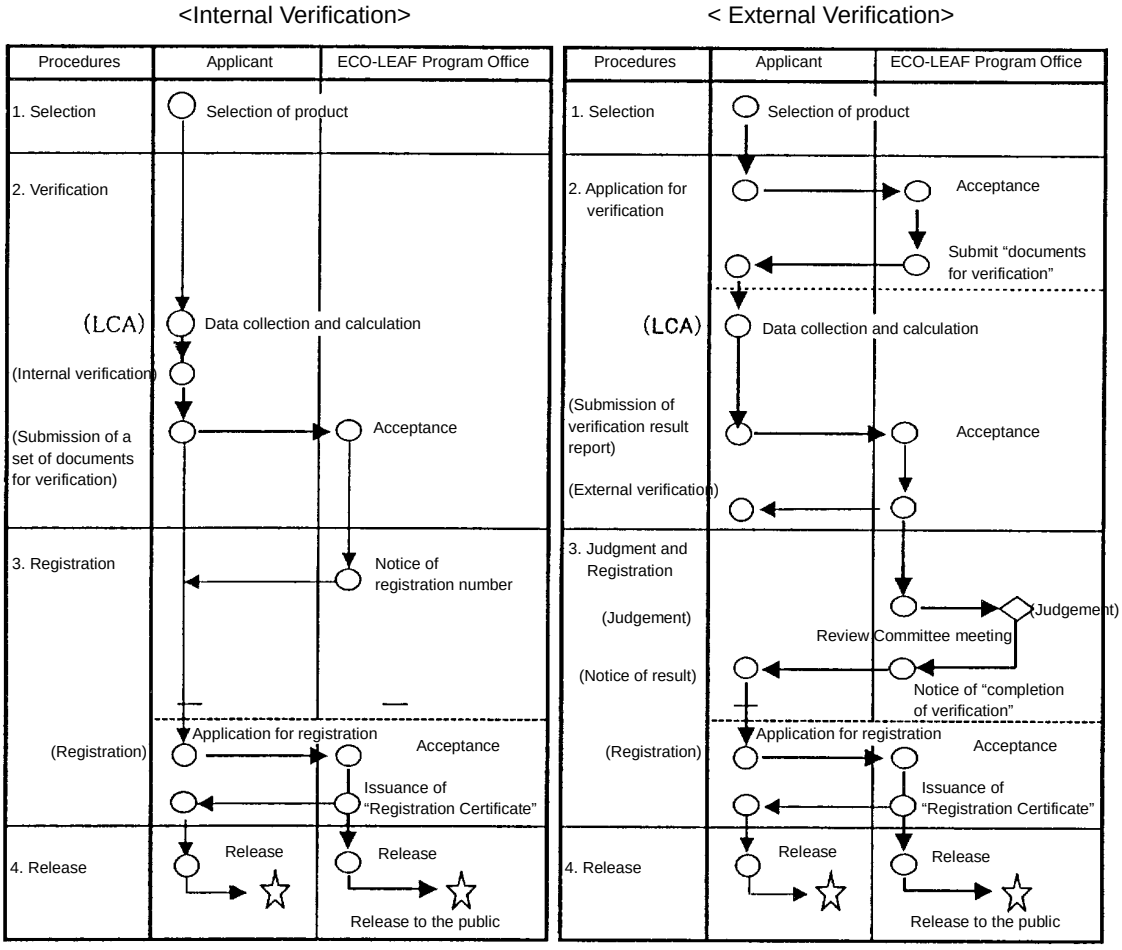


Figure 2.6 ECO-LEAF environmental label program—basic flow from application to registration

Chapter3: Guidelines for the creation EcoLeaf environmental labeling

This chapter explains the guidelines for preparing quantitative environmental information for disclosure, as well as validation support documentation for validating the grounds for the disclosed data and calculation methods.
The former quantitative environmental information for disclosure comprises three forms: PEAD (Product Environmental Aspect Declaration) that provides representative information, PEIDS (Product Environmental Information Datasheet) that details the information, and PDS (Product Data Sheet) that provides the measured and preset values used in the creation of PEIDS.
The latter validation support documentation comprises the breakdown datasheet that provides the grounds for the calculation of the PDS data, the calculation sheet that provides the grounds for the calculation of the PEIDS data and processes, and various flowcharts helpful for understanding these sheets. None of the validation supplementary data is disclosed to the public.

3.1: Items subject to the EcoLeaf environmental labeling program

The items subject to the EcoLeaf environmental labeling program include industrial products, durable consumer goods and general commodities. The labeling is not limited to end products but can also be used for product parts, materials and intermediates e.g. base material. Waste products and waste processing services can also be subject to the EcoLeaf labeling.
Following are product categories with sample items, although other products may be labeled:

① Electronic products (e.g. heavy electric equipment, home appliances, electronic equipment and parts, IT devices and controllers)
② Metal products (e.g. steel, nonferrous metals, ferric products, cables and bearings)
③ Chemicals (e.g. organic/non-organic base chemicals, polymers, plastics, semiconductors, fertilizers, agrochemicals, pharmaceuticals, films, inks and industrial gas)
④ Fibers (e.g. natural/synthetic fibers, clothes and industrial textiles)
⑤ Pulp and paper
⑥ Rubber and ceramic products (e.g. tires, industrial rubber, cement, glass, ceramics, firebricks and pottery)
⑦ Machinery and precision machinery (e.g. industrial machines, machine tools, internal-combustion engines, plants, OA equipment, cameras and watches)
⑧ Transport equipment (e.g. automobiles, motorbikes, railroad coaches, ships and airplanes)
⑨ Consumer appliances (e.g. various products including printed matter and publications, musical instruments, stationary and office supplies and others related to food, clothing and shelter.
⑩ Architecture (e.g. business/residential buildings and civil constructions)
⑪ Energy products (e.g. electricity, town gas, petroleum, coal, LNG and LPG)
⑫ Foodstuff and other agricultural/forestry/fishery products
⑬ Processing services

1) Processing of used products and wastes (including the service of manufacturing service reused/recycled products from disused automobiles, discarded lumber, wasted beverage containers and intermediate lumber)
2) Processing of hazardous chemicals (including the restoration of polluted soil and the removal of toxic substances)

3.2: Creating a PEAD (Product Environmental Aspect Declaration)

The PEAD is an outline of the quantitative environmental information for the product concerned in an easy to understand summarized format and must contain concise descriptions

while taking into consideration uniformity and visual clarity. Consequently, the types and names of products, information providers and environmental aspects emphasized must be clearly expressed in the data. As shown in Form 1 (in the Appendix), the items mentioned in PEAD are classified into five sections, for which the content of each is prescribed as follows:

3.2.1: Section A

In this section, the product specification name subject to the EcoLeaf environmental labeling should be clearly described as set out in the PSC.

3.2.2: Section B

This is the basic information section for the creator of the EcoLeaf label and should contain information on the following items:

① Logo and/or symbol mark of entity making information disclosure
② Name of entity making information disclosure (business name)
③ Contact for the entity making information disclosure (e.g. address, telephone number, home page, and name of department in charge)

3.2.3: Section C

This is the basic information section for the disclosed product and should contain a brief description of the following items to enable the product outline to be objectively understood and identified:

① Name of the product
② Product specifications (items as set out in the PSC)

3.2.4: Section D

This section visually illustrates the outline of the product with pictures, illustrations and flow charts, for defining the scope of the product concerned in an easy to understand manner. If any options etc are included that are not subject to EcoLeaf environmental labeling in the section, the scope of the labeling should be clearly described.

3.2.5: Section E

In this section, quantitative environmental information on the product concerned is clearly described in detail, based on data contained in PEIDS. This section is the most significant part of the PEAD and should be created based on the following provisions:

(1) Items to be mentioned

The following are divided into the required items and optional items. Adoption of optional items is as set out in the PSC:

Required items:	①Global warming load	(CO_2 equivalence)
	②Acidification load	(SO_2 equivalence)
	③Energy consumption	[MJ]
Optional items:	①Ozone depletion	(CFC11 equivalence))
	②Eutrophication	(PO_4 equivalence)
	③Energy resources	(oil equivalence)
	④Mineral resources	(iron ore equivalence)
	⑤ Power consumption at usage stage	[kWh]

⑥ Water consumption at usage stage [kg]
⑦Waste soil [kg]

(2) Lifecycle stages subject to EcoLeaf environmental labeling

The combined quantitative environmental information for all lifecycle stages subject to the creation of EcoLeaf environmental labeling (the scope of which is determined by the PSC) are entered in the three required items mentioned above. It is also possible to add environmental information on specific lifecycle stages.

For the seven optional items, either the combined quantitative environmental information for all lifecycle stages subject to the creation of EcoLeaf environmental labeling, or amongst those, environmental information on specific lifecycle stages, or both, are entered.

(3) Establishing the conditions of use

The duration of use and volume and other conditions of the product are laid down in the PSC:
Duration of use (e.g. xx years, …) ② Volume used (e.g. xx,000 sheets, x liters, …)

(4) Presentation Method

It is recommended that information is provided in either of the following forms:

①Documentation ②Chart ③Graph

The standard form for the above PEAD is horizontal A5 size. However a total of 5sizes are permitted up to a maximum of vertical A4 size, for handling various volumes of information. The details of the forms, including method of notation and arrangement of documents and graphs, are provided separately in the Regulations on EcoLeaf environmental labeling specifications (R-08). The registered mark in the upper right of the PEAD includes the registration number of the product concerned.

3.2.6: Other environmental information

Environmental information that is not subject to validation by the EcoLeaf labeling program, may be included in the margins of the PEAD, provided that the information is verifiable and is one of the following four types:

① Has acquired a separate environmental label
② Has acquired ISO14001 certification
③ Has acquired national etc. approval/ certification/ award
④ Other information

①, ② or ③above require official approval by a third party.

Hazardous chemicals can be assumed for ④, and can be presented in qualitatively or quantitatively in the scope specified for the corresponding PSC (substances covered or chemicals included in them). For example, “The component A contains B grams of substance C.”

(Relevant documents) Regulations on EcoLeaf environmental labeling specifications (R-08)

3.3: Creation of a PEIDS (Product Environmental Information Datasheet)

A PEIDS provides quantitative environmental information, for products that feature in Type Ⅲ environmental labeling.

The data in PEIDS is acquired by the LCA calculation of data in the product data sheet to be described later, and provides the basis of the aforementioned PEAD.

As shown in **Form 2** (in the Appendix), the main data of PEIDS is the LCA inventory analysis (at the top of the chart) and the results of each impact assessment (at the bottom of the chart).

Following are the details on PEIDS:

3.3.1: Lifecycle stages

The four lifecycle stages (production, transportation, use and disposal/recycling), which are the rows in PEIDS, are common to inventory analysis, and results of impact assessment. The details of each stage are defined by PSC.

PEIDS deals with all four lifecycles in principle, although any lifecycle stage other than production may be excluded in the case the subject is a material where a specific application cannot be set, or it is an intermediate or a general-purpose product (e.g. general purpose motor). The scope of lifecycle stages selected is determined by the corresponding PSC.

If the subject of a PEIDS is a material, the item "material" in the production stage should be replaced with "collection of raw material." If the product covered is a processing service, in principle, the use stage is not included when creating the PEIDS, and the item "product" in the production stage is replaced with "processing" and the "disposal/recycling" stage is replaced by the "disposal/removal" stage.

(1) Production stage

This is divided into the material production stage, where materials are created (e.g. steel production from iron ore and coal), and the product manufacturing stage where material processing and assembly is carried out and parts/products are created.

a: Material production stage

This stage deals with the production of material (e.g. iron, aluminum and plastic) from natural resources (e.g. iron ore, bauxite and crude oil), generally including the mining and transportation of raw material. Primary material (e.g. polymeric pellet), processed material (e.g. polymer film/board/tube) is also included in this stage.

If the subject of the PEIDS is a material, as mentioned above, the item "material" is replaced with "collection of raw material," for which an environmental load is not subject to calculation. If it covers a processing service, the PEIDS includes the environmental load from the collection/transportation of the used products and the production of parts necessary for processing.

b: Product manufacturing stage

This stage deals with the production procedure of the product concerned, from the processing of various materials to the assembly of parts or units of multiple parts of the product, or to the product made with the assembly of various parts and units. Generally, it also includes the transportation of various material and parts used in the product manufacturing.

For a processing service, the item "product" is replaced with "processing" and the environmental load from the dismantling, disassembly, sorting and/or dissolution of used products is added to the calculation.

(2) Distribution stage

This stage deals with the transportation of the manufactured products, the replacement parts and consumables, to the site for use. The specific scope for transportation, transport method and the site for use are defined by the corresponding PSC.

(3) Use stage

This stage deals with the power consumption required for when the product is operating and when on standby, the environmental load from the production of and consumption of fuel necessary for using the product, the production of various replacement parts and consumables, and the environmental load for the use, disposal and recycling of the products. The conditions for use and maintenance are defined for each product category in the PSC.

(4) Disposal/recycling stage

This stage comprises the processes of used products up to final processing, including collection, transportation, classification, shredding, sorting, incineration, detoxification,

reclamation and recycling and/or reusing. For a processing service, the "disposal/recycling" stage is replaced by the "disposal/removal" stage, as recycling is included in the processing in the production stage.

3.3.2: Data classification

Data classification, which are the columns in PEIDS, consists of energy consumption, inventory analysis and impact assessment as follows:

(1) Energy consumption

Energy consumption is related to other items including "energy resources" and "environmentally-harmful emission" in the following inventory analysis, as well as "resource exhaustion" and "environmentally-harmful emission" in the impact assessment. If the energy consumption is included in inventory analysis there is a possibility of duplicate addition: therefore the item for energy consumption in PEIDS is separated from the inventory analysis.

(2) Inventory analysis

The table provides the results of LCA inventory analysis, which has a standardized boundary for the input/output of material and energy extending to the natural environment. As a result, data comparability is ensured.

The data classification (column) of the inventory analysis consists of two environmental load items; resource consumption and environmentally-harmful emission. Consumed resources are broadly divided into recyclable or exhaustive items, which are further classified into energy and mineral resources. The items providing environmentally-harmful emission are divided into emission into air, water and soil.

Specific inventory items include the energy consumption of crude oil, coal and uranium ore, and the mineral consumption of iron ore and bauxite. The recyclable resource items cover the resources directly obtainable from nature, including surface/underground water and biomass resources e.g. lumber. The environmentally-harmful emission items contain the substance directly discharged into nature, including CO_2, NOx, SOx, COD, BOD, and solid waste.

(3) Impact assessment

The impact assessment includes the characteristic analysis for its results that are defined in LCA. As its boundary is standardized and extended to the natural environment, similar to the inventory analysis, data comparability is ensured.

The data classification (column) of the impact assessment, in the same way as the inventory analysis, consists of two environmental load items; resource consumption and environmentally-harmful emission. The resource consumption items include exhaustive resources that are divided into energy and minerals, excluding recyclable resources. The environmentally-harmful emission items are subdivided into category items e.g. air pollutants (including global warming, acidification and ozone depletion) and water pollutants (e.g. eutrophication). The selection of category items is determined by PSC.

3.3.3: Calculation method for PEIDS

All data in the items mentioned above are calculated based on the LCA method as follows:

(1) Inventory analysis

The following are subscript characters for the formula:

I: Inventory volume

a: unit load

W: Numerical value subject to the inventory calculation e.g. the amount of supply, use, emission, processing or transportation of the substance
(Sample units: kg, kWh, m^3, kg/km)

(The following characters are provided for a description.)

i: Type of inventory (e.g. crude oil, iron ore, water, CO_2, COD)
j: Type of energy (e.g. electricity, heavy oil LNG)
k: Type of material (e.g. polyethylene, carbon steel paper)
m: Type of processing (e.g. molding, pressing)
n: Type of assembly (e.g. large-scale assembly, small-scale assembly)
t: Type of transportation (e.g. 10-ton truck, ferry)
p: Type of replacements and consumables (e.g. ink, paper)
q: Type of disposal/recycling processing (e.g. shredding, sorting, melting)
u: Use stage (identification character for specifying this stage)
v: Manufacturing stage (identification character for specifying this stage)
y: Manufacturing site
d: Disposal/recycling stage (identification character for specifying this stage)
r: Recycling/reuse stage (identification character for specifying this stage)

The following is the significance of the formula:

$\Sigma_j(a_{ij} \times W_j)$: Where *i* is fixed and the total sum of j is calculated using ($a_{i1} \times W_1 + a_{i2} \times W_2 + a_{i3} \times W_3 + \ldots$)

a. Formula for inventory analysis

The inventory amount (I) of the inventory type (i) in the relevant stage can be calculated using the following formula where the subscript letter j-q replaces x and summing the product of the related numerical value W with the corresponding unit a_{ix} as follows:

$$I_i = \Sigma_j(a_{ij} \times W_j) \quad \cdots\cdots (1)$$

The following is a specific calculation for each stage:

In the explanation below, the term "material" also includes "material for recycling," and "parts" also includes "parts for reuse."

≪Manufacturing stage≫

As described in 3.3.1(1), this stage is subdivided into the material production stage and the product manufacturing stage. In the former, the eco-impact from manufacturing material from resources is tallied. In the latter the eco-impact from processing the material into parts and that from assembling the parts into products are added together.

①Eco-impact calculation for the material production stage

In this stage, the analysis deals with the entire eco-impact from processing material into all the parts of the product concerned. The eco-impact is calculated using the following formula (2), by adding the used amounts of three types of material for parts/material (in Category A, B and C described in 3.4.1) with the corresponding unit load

$$I_i = \Sigma_k\{a_{ik} \times (W_{Ak} + W_{Bk} + W_{Ck})\} \quad \cdots\cdots (2)$$

a_{ik}: Production units for the inventory type (i) of the material type (k) (a I of Figure 3.1)
W_{Ak}: Mass of material (k) used for producing part/material A
W_{Bk}: Mass of material (k) used for producing part/material B
W_{Ck}: Mass of material (k) used for producing part/material C

②Eco-impact calculation for the product manufacturing stage

In this stage, the analysis deals with the entire eco-impact from the procedure including various processes and assembly required to manufacture the product concerned from its materials. The eco-impact is calculated using the following formula (3), by adding up the three types of eco-impact:

$$I_i = I_{iy} + I_{im} + I_{in} \quad \cdots\cdots (3)$$

I_{iy}: Eco-impact from processing parts/material A, B and C into the product at the manufacturing site (see Figure 3.1)
I_{im}: Eco-impact from processing material into parts/material B and C (a2 in Figure 3.1)
I_{in}: Eco-impact from assembling parts/material C (a3 in Figure 3.1)

Each of I_{iy}, I_{im}, and I_{in} is calculated as follows:

$I_{iy} = \Sigma_y (a_{iy} \times W_y)$ ・・・・ (3-1)

$I_{im} = \Sigma_m \{a_{imy} \times (W_{Bm} + W_{Cm})\}$ ・・・・ (3-2)

$I_{in} = \Sigma_n (a_{in} \times W_{Cn})$ ・・・・ (3-3)

a_{ik}: Unit load s for the inventory (i) at the manufacturing site (y)

a_{im}: Unit load s for the inventory (i) for the type of processing (m)

a_{in}: Unit load s for the inventory (i) for the type of assembly (n)

W_y: Consumption of eco-damaging factor (e.g. electricity, fuel, utilities, by-materials) per product unit at the manufacturing site (y)

W_{Bm}, W_{Cm}: Used amount of parts/material B and C in the type of processing (m)

W_{Cn}: Used amount of parts/material C in the type of assembly (n)

≪Distribution stage≫

Distribution where the fuel consumption volume is known or distribution where only the transport conditions are known is assumed: each case is calculated as follows:

①Calculation for where the fuel consumption volume is known

The inventory (I) in the item (i) is calculated as follows:

$I_i = \Sigma_y (a_{ij} \times W_j)$ ・・・・ (4)

W_j: Consumption volume of energy type (j) in the distribution stage

②Calculation for where only the transport conditions are known

$I_i = \Sigma_t \{a_{it} \times (W_t \times L_t / Y_t)\}$ ・・・・ (5)

a_{it}: Transportation unit load per unit mass/distance for the inventory type (i) in the transportation method (t)

W_t: Mass of the transported products or used products/parts

L_t: Transported distance

Y_t: Loading rate (mass standard)

≪Use stage≫

The inventory (I_i) for the item (i) is calculated by adding the eco-impact from all the energy consumption in the use stage to the eco-impact related to all the necessary replacements and consumables. The latter also includes the eco-impact from manufacturing and disposal/recycling stages.

$I_i = \Sigma_j (a_{ij} \times W_j) + \Sigma_p \{(a_{iv.p} + a_{id.p}) \times W_{u.p}\}$ ・・・・ (6)

W_j: Consumption of the energy (j) in the use stage

$a_{iv.p}$: Manufacturing unit load applied to the inventory (i) of replacements/consumables (p)

$a_{id.p}$: Disposal/recycling unit load applied to the inventory (i) of replacements/consumables (p)

$W_{u.p}$: Consumption of the replacements/consumables (p) in the use stage

≪Disposal/recycling stage≫

The inventory (I_{id}) for the item (i) in the disposal/recycle procedure based on the preset scenario, including crushing, sorting, melting and land filling, is calculated using the formula (7) as follows. In this scenario, the recycling capacity is calculated in consideration of the decomposability and sortability of the product components, as well as the collection, recycling, and reuse rate of the product or similar product: it is advisable to standardize PSC as much as possible.

$I_{id} = \Sigma_q (a_{id,q} \times W_{d,q})$ ・・・・ (7)

$a_{iv,q}$: Unit load applied to the inventory (i) of the disposal/recycling (q)

$W_{d,q}$: Processed amounts of the used products in the disposal/recycling (q)

Recycling and reuse give the eco-impact shown in formula (7), while they are also effective to reduce the eco-impact from manufacturing new materials and parts. The effect of removal can be subtracted from the eco-impact from recycling and reuse.

b: Unit load

≪Definition of unit load≫

Unit load is defined as the amount of material or its auxiliary material (utility) necessary for manufacturing the product unit volume. In the EcoLeaf labeling program, the term means the material consumption and emission per unit amount of the product, tracing back to the input and output of natural resources (e.g. iron ore and crude oil) and eco-damaging substance (e.g. CO_2 and SOx). Unit load is divided into the following three types, in accordance with the scope of possibility of use:

①Common unit load

The unit load applicable to all product types created by this center for the EcoLeaf program and authorized by the PSC committee.

②PSC unit load

The unit load applied to each PSC, prepared by the PSC-WG and authorized by the PSC committee. The PSC unit load is intended for the items in a single classification in principle, although it is applicable for other PSC on the condition that its grounds have been clarified.

③Individual unit load

It is the unit load intended just for labeling of a specific product. Individual unit load is prepared based on the product data individually collected based on actual measurement or hearing, verified by the EcoLeaf program office and authorized by the review panel.

≪EcoLeaf unit load table (database)≫

The EcoLeaf unit load varies considerably depending on its data source and the method used for data collection/processing (including allocation and ruling). For the EcoLeaf labeling program, the EcoLeaf unit load table (database) available for common use should be applied to each product in principle, to prevent the results of inventory analysis from varying by the type of unit load.

Appendix 1 provides a sample table of EcoLeaf unit loads commonly used for inventory analysis. The column items of the table are the same as those in the inventory analysis in PEIDS that shares the database, while the items in rows are the names of materials and processes.

To ensure the transparency and reliability of the unit load, the information on the data source and quality should be provided under each column for unit load.

≪Creation of a new unit load≫

Although the common unit load should be applied to the creation of an EcoLeaf label in principle, it is also permitted to establish a PSC/individual unit load for a specific product or product classification. A new unit load needs to be validated by the inspectors, discussed by the review panel, and given the final approval for use by the PSC committee.

(2) Impact assessment

a: Formula for impact evaluation

The data in each category in column (P_n) is calculated by adding together the inventory amount (I_i) in the inventory analysis section multiplied by the various characterization coefficients α_{in}:

$$P_n = \Sigma_q (\alpha_{in} \times I_{i,}) \quad \cdot \cdot$$

・・(8)

The subscript character i describes the type of inventory (e.g. iron ore and CO_2), and the subscript character n the category of impact (e.g. global warming and acidification).

b: Characterization factor

Appendix 2 provides an example table (database) of characterization coefficients applied to the formula for eco-impact evaluation by category. The database, which is commonly used in the EcoLeaf labeling program in principle, provides characterization coefficients for the items (e.g. CO_2, NO_x and SO_x) related to each category (e.g. global warming and acidification), as well as the data definitions and sources.

3.4: Creation of a product data sheet

The product data sheet provides the input/preset data used for the calculation of the data in PEIDS. More specifically, the sheet contains the input data and prerequisites for LCA calculation, that is, the data measured or surveyed by the EcoLeaf applicant.

The specific contents of the data sheet (e.g. data calculation method) are provided in the breakdown data sheet described hereafter, and the inspectors check the contents.

The data in product data sheets are not comparable to each other, as the range, items and depth of data research vary by label applicant and/or product.

Appendix 3 provides an example of a product data sheet. The contents of the product data sheet are described in 3.4.1 – 3.4.5, while the details are determined by the corresponding PSC.

3.4.1: Product information

In compliance with the material classification criterion, the mass of raw material and parts composing the product concerned should be provided per unit of product. The material classification criterion specifies (classifies) material, for calculating the eco-impact from manufacturing the material of the product. For example, plastics can be classified into three criteria: Criterion 1 (plastics), Criterion 2 (thermoplastics) and Criterion 3 (polyethylene). The selection of the classification is based on the list of common unit loads.

The raw material and parts described above are classified into the following three types, provided whether or not the processing/assembly of the substance before it is brought to the site should be considered in the assessment.

①Parts/material A

Parts/raw material which does not require an eco-impact from processing up to arrival at the site and assembly (in preparation for the manufacturing of the product) to be calculated using the common unit load provided by the EcoLeaf labeling program.

②Parts/material B

Parts/raw material which requires an eco-impact from processing up to arrival at the site to be estimated with the common unit load provided by the EcoLeaf labeling program, while the eco-impact from its assembly is not required.

③Parts/material C

Parts/raw material which requires an eco-impact from processing and assembly) is required to be estimated with the common unit load provided by the EcoLeaf labeling program.

The material classification above is requisite for LCA calculation. For example, unprocessed/unassembled material (e.g. steel plate and polymer pellet) used for the product concerned is generally classified into Parts/material A. However, even if the material is identical, if the material has undergone the processing necessary for production of the product concerned when it is transported to the site, and the eco-impact from the processing is not clarified at the time of processing, then the material is classified as Parts/material B because

the eco-impact needs to be estimated using the common unit load. The material that is processed and not assembled is classified into Parts/material B when the eco-impact from the processing is unspecified, while it belongs to Parts/material A if the eco-impact is provided. The unit of parts that are processed and assembled are classified into Parts/material C when the eco-impact in the processing and assembly stages is unspecified, Parts/material B when the eco-impact from either stage is provided, and Parts/material A when the eco-impact in both stages are clarified.
The following Chart 3.1 describes the differences between Parts/material A, B and C:

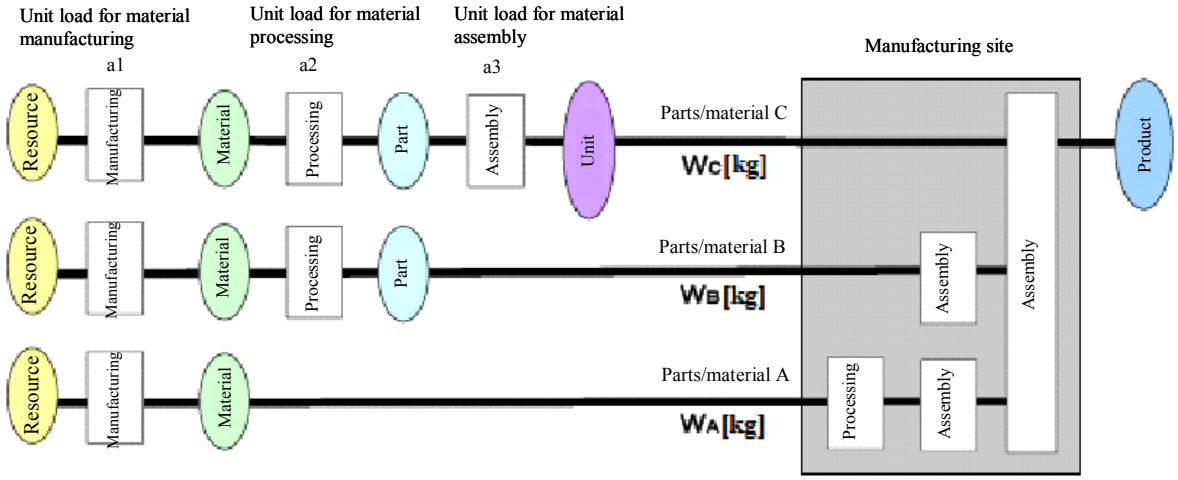


Chart 3.1: Classification of product material/parts at manufacturing site

3.4.2: Data on manufacturing site

The volume consumed and emitted at the site for the production and assembly of the final product of part/material A should be provided separately for consumption and emission after being converted to a per product unit, in addition to providing an outline of the calculation method applied.

3.4.3: Data on the distribution stage

Along with the conditions for product transportation shown in 3.3.1(2), the volume of mass consumed and emitted during transportation should be provided after being converted to a per product unit in addition to providing the grounds for the established method and an outline of the calculation method applied.

3.4.4: Data on the use stage

The volume of electricity, fuel and consumables consumed and emitted for the operation of the product and when it is on standby, should be provided separately for the product itself and for replacement consumables related after being converted to a per product unit in addition to providing the grounds for the established method and an outline of the calculation method applied .

(1) Data on used substance

Provide power consumption, various fuel consumption and the type and volume of replacement parts or consumables, and provide the grounds for the established method and an outline of the calculation method applied. This data is used for the calculation of eco-impact in the use stage.

(2) Data on the disposal/recycling of replacement parts/consumables

Set the scenario for defining the concrete conditions for processing used replacement parts/consumables in the disposal/recycling stage and provide those grounds and outline of

the calculation method applied. The data calculated based on this scenario is used for the calculation of eco-impact during disposal/recycling of replacement parts/consumables.

3.4.5: Data on the disposal/recycling stage

Set the scenario for defining the concrete conditions for processing used products in the disposal/recycling stage and provide those grounds and outline of the calculation method applied. The data calculated based on the scenario is used for the calculation of eco-impact during the disposal/recycling stage of used products.

3.5: Creation of validation support documentation

Validation support documentation is private data used for validation for ensuring objectivity, reliability and validity of the declared data for the EcoLeaf labeling program, that is, PEAD, PEIDS and product data sheets.

Support documentation includes; various flow charts available for the inspectors to understand the summary of the stages and products concerned; breakdown data sheets that provide the grounds and the calculation methods of product data sheets; and reference calculation sheets that describe the procedures of inventory analysis and calculation of the results of impact valuation in PEIDS.

3.5.1: Flow diagram of product parts

The flow diagram should be consistent with the corresponding breakdown data sheet (for products), as it is the supplementary material for helping the inspectors to roughly understand the structure and main parts of the product concerned.

Form 4 (in the Appendix) provides an example flow diagram for a washing machine. The diagram at the left side of this form describes the outline of product structure, which contains the main parts and units of the product. The table in the right explains the names of the main parts and units and their history e.g. processing and assembly up to when they were brought to the site. The diagram classifies the product into each unit comprising the product and explains the parts composing each unit, to enable the inspectors to better understand the structure of the product concerned.

3.5.2: Flow charts

Flow charts, which consist of the manufacturing flow chart and the stage flow chart, help the inspectors to clearly understand the stages and process boundaries of the product concerned. The former chart illustrates concrete processes in the manufacturing stage, which is the main part in the lifecycle of the finished product: the latter illustrates an outline of the lifecycle stage concerned.

(1) Manufacturing flow chart

Form 5-1 (in the Appendix) provides an example of a manufacturing flow chart: the chart should be consistent with the breakdown data sheet described below (for manufacturing sites), as it is supplementary material. As shown in the example, manufacturing flow charts generally flow from the left, with transport of parts/material to the site, processing and assembly into finished products, quality control, packaging, right up to immediately before shipping.

These enable the inspectors to understand processing and assembly, which are the main parts of product manufacturing, the chart explains the manufacturing flow focusing on the assembly of the main parts and units into the finished products, and covering processes right up to immediately before shipping of the finished product including quality control and packaging.. The classification between Parts/material A, B and C should be clear in the chart: In particular, the processing of Parts/material A at the manufacturing site (See Figure 3.1)

should be described in detail.

(2) Stage flow chart

Form 5-2 (in the Appendix) provides an example of a stage flow chart: the chart should be consistent with the breakdown data sheet described below, as it is supplementary material While only outline conditions are provided for the manufacturing, transportation and use stages, detailed procedures should be given for the disposal/recycling stage, as the possible scenarios for the stage are various and complicated.

3.5.3: Breakdown data sheet

This sheet provides the calculation procedure for the data in the product data sheet. There are three types of breakdown data sheet as follows: type 1 (for product), type 2 (for manufacturing site) and type 3 (for lifecycle stage).

(1) Breakdown data sheet: Type 1 (for product)

Form 6-1 (in the Appendix) provides an example of Type 1: the breakdown data sheet should be consistent with the corresponding product data sheet, in which the data is used as the product information.

Related to the flow diagram of product parts (3.5.1) and the manufacturing stage flow chart (3.5.2 (2)), the following items are entered from the left in the sheet: name of units composing the product, name of parts, previous history e.g. processing and assembly (differentiate for part/material A, B, C), main material and its mass. Also, the mass of each material with a unit load for material manufactured is allocated and noted in the right hand side of the sheet. The total mass of Parts/material A, B and C is also provided per material in the bottom of the sheet.

(2) Breakdown data sheet: Type 2 (for manufacturing site)

Form 6-2 (in the Appendix) provides an example of Type 2: the breakdown data sheet should be consistent with the manufacturing site information column of the product data sheet, as the results are described therein.

The items of the data sheet include the amount of production at the manufacturing site, followed by the amount of energy, water, consumables and fuels consumed for transport on the site, as well as the environmentally harmful emission from the site to air, water and soil. As this table is created based on the premise of an ISO14001 Environmental Management System certified factory, allocation per product unit is available based on the site authorized data.

(3) Breakdown data sheet: Type 3 (for lifecycle stage)

Form 6-3 (in the Appendix) provides an example of Type 3: the breakdown data sheet should be consistent with the corresponding columns of distribution, use and disposal/recycling stages of the product data sheet, as the results are described therein.

The names of stages (e.g. product distribution, use and disposal/recycling) are provided in the left margin of the sheet.

For the distribution stage, the transportation method (e.g. truck) is provided under the main heading, the specification of the transportation (e.g. 2-ton truck) under the secondary heading, and the details on the transportation (e.g. distance and loading rate) under the minor heading.

For the use stage, the category of substance (either energy or material) is provided under the main heading, and the name of the substance under the secondary heading. In case the product concerned is a washing machine, for example, electricity is categorized into energy while tap water and detergent are classified under materials. The minor heading contains the total of used amount of energy/material in the use stage, or the used conditions (e.g. consumption per unit, time for use per day, days for use per year and lifetime (years)).

For the disposal/recycling stage, the measured power consumption for crushing and sorting are provided, as well as the processing capacity.

3.5.4: Reference calculation sheets

There are two types of reference calculation sheets as follows: further details are available in the manual for creating validation documents.

(1) Referential calculation sheet: Type 1 (for inventory analysis)

It provides the specific calculation procedure of the stages applied in PEIDS: various unit loads are applied based on the product data sheet in compliance with the calculation method for inventory analysis described in 3.3.3 (1).

It is necessary to prepare the calculation sheets available for the inspectors to check if the inventory is calculated using the data in the product data sheet, appropriate unit loads and formulas. In case a new unit load is prepared, the details on the data to be used as grounds for that should be provided along with the validation and calculation for the validity of the applied data.

(2) Reference calculation sheet: Type 2 (for impact assessment)

This sheet provides the specific procedure of calculation for the values in the impact assessment, which is estimated based on the results of inventory analysis, with the appropriate characterization factor, in compliance with the calculation method described in 3.3.3 (2).

In this chapter, it was mostly assumed the products were to be assembled, so the composition of each form and validation support documentation would be appropriate for validation relevant to such products. Consequently, the forms mentioned in this section (especially Form 4, 5-2 and 6-1) may be inappropriate to other types of products. In that case, the forms can be modified so as to be easier to understand, within the scope of the purpose of creation of validation support documents.

[Reference] Manual for creating validation documents for product data (M-03)

Chapter 4: Criteria and procedures for the EcoLeaf environmental labeling program

While the previous chapter describes the creation processes of the EcoLeaf environmental label, this chapter provides the criteria and procedures that ensure the objectivity of the created label. Specifically, it determines the criteria or requirements related to PSC, system certification, data validation, official registration, and data correction and their subsequent procedures.

4.1: Criteria and procedures for establishing PSC (Product Specification Criteria)

As described in Section 2.2.1, PSC are established to ensure the objectivity and comparability of the disclosed information, by standardizing fundamental requirements for the requirements and rules of the LCA calculation applied for the scope of each product for each product category covered.

Therefore, to establish a PSC, the party implementing the EcoLeaf environmental labeling program need to clarify requirements that should comply with each of the following items:

① Scope of the product and parts comprising the product
② Requirements and the scope of data collection
③ Conditions of the LCA calculation for the allocation and cutoff used
④ Specification of applied unit load and characterization coefficient
⑤ Specification of items to be disclosed and establishment of presentation method

4.1.1: Criteria for establishing PSC (Product Specification Criteria)

(1) Approval for establishing PSC

All the parties concerning the EcoLeaf environmental labeling program (See Section 1.3) can propose to establish PSC. The approval for the proposal is decided by the PSC review committee, in consideration of the following factors:

① Consistency with the aim and practicality in the EcoLeaf environmental labeling program
② Social and ethical perspectives
③ Significance of the disclosure of the EcoLeaf environmental label

All interested parties concerning the EcoLeaf environmental labeling program can propose to amend PSC. Adoption of the amendment is decided by the PSC review committee, after the review on the contents of the proposal (reason).

(2) Requirements for establishing Product Specification Criteria (PSC)

PSC are established based on the acceptance of a PSC proposal mentioned above. That is, the rules on each criterion of PSC should be established based on its corresponding lifecycle stages (PEIDS row items) and data classification (PEIDS columns), applicable for executing the EcoLeaf environmental labeling program. **Appendix 3** provides the requirements in detail.

4.1.2: Procedures for establishing PSC

(1) Requirements for PSC-WG members

The members of the PSC working group (hereafter PSC-WG) are required to meet the following conditions:

① To understand the manufacturing procedures or functions/quality of the concerned product
② To have a basic knowledge of the LCA method

If other members of PSC-WG provide their consent, however, a person who does not meet the requirements can participate in the working group.

(2) Procedure of establishing PSC

≪Application for PSC≫

A party seeking to establish a PSC should fill out and submit an Application for establishing PSC (F-20) to the EcoLeaf program office.

≪Decision to approve a PSC application≫

The PSC committee reviews the submitted PSC application form to determine whether it is appropriate to establish the PSC. The EcoLeaf program office will advise the applicant of the judgment by the committee.

≪Organization of PSC-WG≫

Once the application for establishing PSC is approved, the EcoLeaf program office advertises on its web site for members of the PSC working group (PSC-WG).

≪Creation of the PSC draft≫

The members of the PSC working group (PSC-WG) prepare the draft of PSC in compliance with the separately established rules on establishing PSC (R-06). Preparation of the draft is conducted by the chairperson and secretary appointed from the PSC-WG members. The chairperson is responsible for submitting the draft to the PSC review committee, and provides an explanation of it. Procedures for agreement and approval are described in R-06.

≪Approval by the PSC committee≫

The draft PSC submitted by the PSC-WG is reviewed by the PSC committee for determining whether the approval should be given to the PSC. The committee has a right to either amend the submitted PSC draft, or require the PSC-WG to amend or reexamine the draft.

≪Publication≫

The EcoLeaf program office will publish the PSC established by the PSC-WG on its web site.

The following **Figure 4.1** provides the administrative procedures for PSC development

Procedures	Applicant	EcoLeaf program office	Necessary form
1 PSC application	send back	approval	"Application form for establishing PSC" PSC committee's judgment
2 Announcement of PSC-WG organizing	(Public announcement)		(on JEMAI website)
3 PSC-WG 4 Drafting of PSC	Activities of WG	Organization of WG	
5 Establishment of PSC		Members of PSC review committee meeting <Establishment> / PSC review committee meeting	
6 Publication of PSC		Publishing	

Figure 4.1: Administrative procedures for the establishment of PSC

[Reference] Rules for establishing Product Specification Criteria (PSC) (R-06)

4.2: Criteria and procedures for the certification of product environment data collection system

The following are the certification criteria and procedures for an operator's product environmental data collection system (hereafter system) described in Section 2.2.2..

This system certification is for verifying whether the company obtains the internal business operation system available for calculating quantitative product environmental data, and the

system has been operated appropriately, effectively and continuously. The aim of the certification is to ensure the reliability of quantitative data provided in the EcoLeaf environmental label. The certified company is allowed to verify its data collection system for the EcoLeaf environmental labeling program by using internal inspectors: in this way the company is able to reduce the time and cost for validation of this system. Therefore this system certification is a counterpart to internal validation.

4.2.1: Criteria for certification of product environment data collection systems

(1) Certification criteria items

System Certification is offered to systems that provide product environmental data of a specified source, and which has established method, criteria and responsibilities for the EcoLeaf environmental labeling that have functioned continuously. Specifically, they are comprised of the following seven systems:

① Product data collection system
② Manufacturing site data collection system
③ Distribution, use, and disposal/recycling data collection system

The following items must be prepared for these three systems:

≪Items related to data source ≫

a: Product data

- Method and criterion for specification of material, parts and units of the product
- Method and criterion for measurement of material, parts and units of the product
- Method and criterion for specification of processing and assembly of the product

b: Data on manufacturing site

- Method and criterion for the specification of types of energy and material used at manufacturing site, as well as the specification of environmental impact substances among them
- Method and criterion for the calculation of amount of each energy/material used at manufacturing site, as well as the amount of each environmental impact substance

c: Data on distribution, use, and disposal/recycling stages

- Method and criterion for specification of data items fundamental for setting requirements for each stage
- Method and criterion for specification of data calculation fundamental for setting requirements for each stage

≪Measuring/recording/calculating≫

- Responsibilities and routes for recording and calculating of the measured data
- Arrangement of the calculated data available for identification and retrieval
- Establishment and standardization of necessary administrative procedures related to the method/term of data storage and protection, as well as data destruction

④Data processing

The following are the requirements for the system that processes the calculated data into the quantitative information provided in the EcoLeaf environmental label:

- System and criterion in charge of the responsibilities and authorities for executing LCA calculation
- Posting of LCA executors
- Appropriate tools with operation standards necessary for LCA calculation
- Criterion for data estimation method and procedures applicable for new products

⑤Data validation system

The method, criterion and organization should be constructed to enable internal validation to be carried out.

⑥Data correction system
The method, criterion and organization should be constructed to enable correction of a disclosed EcoLeaf environmental label.
⑦EcoLeaf environmental label issuing system
The system for issuing the EcoLeaf environmental label should be established.

All the requirements above (methods, procedures and system structures with responsibilities and authorities) should be maintained in written form.

(2) Other requirements
The following three items have been established. Further details are provided in the separately established EcoLeaf environmental labeling program system certification (R-05) (System certification regulations):

① The system certification is valid for three years, and should be reconsidered every three years. The certified system is required to be verified at least once a year, otherwise, the EcoLeaf program office may cancel the system certification.
② The system certification is examined by the system certification auditors who are certified by the EcoLeaf program office, while the EcoLeaf program office determine whether or not it is granted by the review committee.
③ The qualifications for the system certification auditors are provided in Chapter 6.

4.2.2: Procedures of System Certification
≪Application≫
An applicant should fill out and submit the application form for System Certification (F-13) to the EcoLeaf program office.
≪Procedure for the examination of the applied system≫
Two auditors are appointed for the examination of the applied system. Responding to the application, the EcoLeaf program office should reveal the system certification auditors to the applicant, who is allowed to challenge the EcoLeaf program office to replace the auditors. To inaugurate System Certification, the auditors are responsible for adjust ing the scope and schedule of examination with the applicant.
≪Examination for System Certification≫
The auditors should examine the applied data collection system in compliance with the rules on system certification for EcoLeaf environmental labeling program (R-05), and prepare and submit the report on the results to the EcoLeaf program office soon after the examination is completed. It is also obligatory on the auditors to present the results of the examination in the PSC review committee meeting.
≪Review of the examination results≫
The PSC review committee reviews the examination results submitted by the system certification auditors, to determine whether or not the certification should be granted to the concerned system. The review committee has the right to require the system certification auditors to carry out an additional examination or reexamination.
≪Notification of the review results and registration of System Certification≫
JEMAI will notify the applicant of the results of review by the committee. Once the System Certification is granted, JEMAI will register the name of applicant and the certified criterion of the system on the list of registered System Certification holders (F-17).

The following **Figure 4.2** describes the administrative procedures from the application to registration of System Certification:

Procedures	Applicant	EcoLeaf program office	Necessary form
1 Selection of subject /		Selection of system to be certified	
2 Application for System Certification		Acceptance	"Application form for System Certification" (Notice of acceptance)
(Review)			System validation document (in the form set by the applicant)
3 Certification/ registration (Judgment)		<Judgment> Review committee meeting	
(Notice and reply)		Issuance of certification	"Notice of Certification"
(registration)		Registration	

Figure 4.2: Administrative procedures from the application to registration of System Certification

[Reference] Rules on system certification for EcoLeaf environmental labeling program (R-05)

4.3: Product environmental data validation criteria and procedures

This section describes the validation criteria and procedures for quantitative data provided in the EcoLeaf environmental label mentioned in Section 2.2.3.

4.3.1: Subjects of data validation and validation method

(1) Subjects of data validation

Subjects of data validation are set for each product unit in principle. As described in Chapter 3, data in the following documentation are verified:

① Product Environmental Aspects Disclosure (PEAD)
② Product Environmental Information Data Sheet (PEIDS)
③ Product Data Sheet
④ Flow diagram of product parts
⑤ Flow charts (stage flow chart and manufacturing flow chart)
⑥ Breakdown data sheet (for products/manufacturing site/life cycle stages)
⑦ Reference calculation sheet (for inventory analysis/impact assessment)

(2) Validation method

Data validation should be executed in conformity with the type of documentation, in accordance with the criteria to be mentioned in Section 4.3.2. The documentation containing the subject data is examined to verify its conformity with PSC and confirm data validity (e.g. contents of breakdown sheet and appropriateness of unit load/characterization coefficient choice) with the evidence. Onsite investigation is also executed when necessary.

(3) Validation of individual unit load

When an individual unit load is adopted for establishing PSC, it is subject to data validation. The proposal for adoption of individual unit load for the EcoLeaf labeling will be accepted

after the validation by the EcoLeaf program office and the review by the PSC review committee.

4.3.2: Validation criteria

Data validation should be in accordance with the following criteria:

① Conformability to the established PSC
② Validity of LCA calculation (See. Chapter 3)
③ Appropriateness of the data base

4.3.3: Internal and external validation

Data validation is executed either internally or externally as follows:

(1) Internal validation

①When the company with System Certification adopts internal data validation, two internal inspectors (qualified for the data validation in the EcoLeaf labeling program) should be appointed.
②At least two internal inspectors are required for validation per data collection system: the company is required to inform to the EcoLeaf labeling office on the inspectors including their names and duties in advance. If the internal inspectors are replaced, the company should report the personnel change to the EcoLeaf labeling office.
③The company that adopts internal validation should submit a set of the forms required for validation (described in Chapter 4.3.1 (1)) for each product unit to be verified.
④The internal inspectors should be independent from the preparation of data to be verified.

(2) External validation

①External data validation applies to companies whose data collection system has not been certified.
②External validation is executed by a team of inspectors or validation organization appointed by the EcoLeaf labeling office. External inspectors should be qualified for the data validation in the EcoLeaf labeling program.

4.3.4: Validation procedures

(1) Validation procedures

≪Application≫
An applicant for external validation should fill out and submit the request form for validation of product environmental data (F-26) to the EcoLeaf labeling office. No preparatory procedure is necessary for internal validation.
≪Execution of internal validation≫
Internal validation should be executed by two internal inspectors who are registered to the EcoLeaf labeling office.
When internal validation is completed, the procedures described in Section 4.3.3 (1) should be followed.
≪Execution of external validation≫
External validation should be executed by two inspectors who are selected by the EcoLeaf labeling office, in response to a request for external validation. The EcoLeaf labeling office should present the selected inspectors to the applicant, who has the right to request the replacement of the inspectors.
To execute external validation, the inspectors should negotiate with the applicant on the scope, procedures and schedule.
External inspectors must prepare and submit the reports on the results to the EcoLeaf labeling office soon after the validation is completed: they are also obliged to present on the results of

validation at the PSC review committee meeting.
≪Applied criteria for data validation≫
Both internal and external inspectors should execute data validation in compliance with the rules on validation of product environmental data (R-07).
≪Judgment for reviewed validation≫
The PSC review committee determines the reviewed validation based on the reports on the validation results. When any inappropriateness is found in the validation, the PSC review committee can request the inspectors for additional or second validation.
≪Notice of results of the review≫
The results of the review by the PSC review committee should be reported to the applicant for external validation by the EcoLeaf labeling office.

(2) Period of validation procedures

A certain time period is set for validation procedures from application to notice of results.

The following **Figure 4.3** provides the administrative procedures for internal validation, while **Figure 4.4.**describes those for external validation.

[Reference] Rules on validation of product environmental data (R-07)

Procedures	Applicant	EcoLeaf program office	Necessary form
1 Validation (LCA) (Internal validation)	Data collection/calculation		
(Submit of a set of validated documentation)		Acceptance Notice of registered number	(Data documentation for validation) • PEAD • PEIDS • Product Data Sheet • Flow diagram of product parts • Flow charts (stage flow chart and manufacturing flow chart • Breakdown data sheet (Type 1, 2 and 3) • Reference calculation sheet (for inventory analysis) • Reference calculation sheet (for impact assessment)
2 Judgment	(Publication of registration)		Notes The results of data validation is not subject to judgment. Only when an individual unit load is applied, review committee determines if it is appropriate based on the validation by EcoLeaf Program Office.

Figure 4.3: Administrative procedures for internal validation

Procedures	Applicant	EcoLeaf program office	Necessary form
1. Request for validation (LCA) (Submit of the report on validation results) (External validation)	Receipt of application form Data collection/calculation	Acceptance Sending of application form Acceptance	"Request form for validation of product environmental data" Application form for validation (Acceptance and reply) common unit load characterization coefficient (Data documentation for validation) • PEAD • PEIDS • Product Data Sheet • Flow diagram of product parts • Flow charts (stage flow chart and manufacturing flow chart • Breakdown data sheet (Type 1, 2 and 3) • Reference calculation sheet (for inventory analysis) • Reference calculation sheet (for impact assessment)
2. Judgment (Judgment) (Notice of judgment)		<Judgment> Review committee meeting	"Notice of judgment"

Figure 4.4: Administrative procedures for external validation

4.4: Outline and procedures of official registration and publication of the EcoLeaf environmental label

The registered EcoLeaf environmental label should be published by the parties concerned following the procedures below.

4.4.1: Outline of the official registration of EcoLeaf environmental label

(1) Subject of registration

The types of EcoLeaf environmental labels are PEAD, PEIDS, and product data sheet for each product unit.

(2) Procedures for publication

The EcoLeaf environmental label is published by both the EcoLeaf program office and the company that obtains the label.

① It is obliged to publish the registered PEAD and PEIDS by JEMAI, while the product data sheet is published as the secondary stage. Product data sheet is provided as the base data

for PEIDS on demand, available on the JEMAI web site.

② When the EcoLeaf environmental label is published by the registered company, its format for the web site should be either a or b, and any of a, b, c or d as follows is available for other documentation for the registered product as well as its catalog.

a: PEAD, PEIDS and product data sheet
b: PEAD and PEIDS
c: PEAD
d: "EcoLeaf Registration Mark"

(Note): The registration mark is attached to PEAD, PEIDS and the product data sheet.

③ The requirements for the EcoLeaf Registration Mark will be described in Chapter 5.

(3) Issue of the EcoLeaf certification

JEMAI will issue the EcoLeaf certification label for each registered product: the label includes the name and model of the product, name of applicant, registration number, PSC and date of registration.

(4) Conditions for cancellation after official registration of the lable

An officially registered EcoLeaf environmental label can be canceled by either of the following conditions:

① The registered company requests the cancellation of registration.

② Any inappropriateness is found in the data published for the purpose of the EcoLeaf environmental labeling program.

4.4.2:

Procedures for the official registration of an EcoLeaf environmental label

≪Application≫

An applicant for the registration of an EcoLeaf environmental label should fill out and submit the application form for the publication of an EcoLeaf environmental label (F-28) to the EcoLeaf labeling office.

≪Registration≫

Once the application is accepted, the EcoLeaf labeling office adds the registered data in the data base list, and issues a registration certificate without delay.

≪Publication of the EcoLeaf environmental label≫

The following **Figure 4.5** provides the administrative procedures from the application to publish of EcoLeaf environmental label.

Procedures	Applicant	EcoLeaf program office	Necessary form
1 Registration		(Completion of data validation) acceptance	
(registration)	application for registration	acceptance issue of certification	"Application form for EcoLeaf label registration" "Certification"
2 Publication	Publication	Publication	"EcoLeaf environmental label" • PEAD • PEIDS • product data sheet
Cancellation	Request for cancellation	(accept as required)	"Application form for cancellation"

Figure 4.5: Administrative procedures from the application to publish of the EcoLeaf environmental label

[References] Rules for the registration and publication of the EcoLeaf environmental label (R-09)

Rules on specifications for the EcoLeaf environmental label (R-08)

4.5: Outline and procedures for correction of the registered EcoLeaf environmental label

4.5.1: Conditions for data correction

The registered EcoLeaf environmental label may be corrected in each of the following cases

① The registered product data based on the estimation (either in the design or plan) before its publication are altered to the ones based on the actual measurement later.

② Any alternation is made in the published data, e.g. the change in the product manufacturing line.

③ Any error or incompletion is found in the published data.

④ The registered company agrees with the data correction in response to an objection by a third party.

⑤ Any other reasons the EcoLeaf environmental labeling office considers to be appropriate.

4.5.2: Procedures of data correction

≪Application≫

The registered company that obtains the EcoLeaf environmental label should fill out and submit the application form for correction of EcoLeaf environmental label (F-30) to the EcoLeaf labeling office.

≪Judgment≫

① Once the application for data correction is accepted, the EcoLeaf environmental labeling office consults the PSC review committee with the necessity of data validation.

② In case it is judged the concerned data needs validation, the validation should be executed in compliance with the procedures provided in Section 4.3.

③ In case it is judged the concerned data needs no validation, the EcoLeaf environmental labeling office confirms the data correction following the directions by the PSC review committee.

≪Execution of correction≫

① The registered company corrects the EcoLeaf environmental label in response to the notice of permission of correction by the EcoLeaf environmental labeling office.

② The registered company corrects the concerned EcoLeaf environmental label revealed on its web site, along with the reason of correction. The concerned data in other media (e.g. catalog) should be also corrected appropriately.

③ The EcoLeaf environmental labeling office also corrects the concerned EcoLeaf environmental label revealed on its web site, along with the reason of correction.

≪Temporary measure before the completion of correction≫

As a temporary measure until the registered company receives the permission notice of correction, the EcoLeaf environmental labeling office is allowed to suspend the publication of the concerned EcoLeaf environmental label by it own decision, at the time the application form for data correction is submitted.

The following **Figure 4.6** describes the administrative procedures from application to completion of data correction.

Procedures	Applicant	EcoLeaf program office	Necessary form
1 Application for data correction		acceptance	"Application form for data correction" (Acceptance and reply)
(Review)	hearing		
2. Judgment (Judgment) (Notice of the decision)	 Publication of replacement	<Judgment> PSC Review committee meeting correction Publication of replacement	•

Figure 4.6: Administrative procedures from application to completion of data correction
[Reference] Rules on the publication of EcoLeaf environmental label (R-09-02)

Chapter 5 Ecoleaf registered mark

5.1: Elements of Ecoleaf registered mark

As shown in **Picture 5.1** on the right, the Ecoleaf registered mark is presented with a registration number, which is for either the Eco-leaf labeling given to the relevant product or the System Certification for the data collection system.

Picture 5.1: Ecoleaf registered mark

5.2: Conditions for the use of Ecoleaf registered mark

The users of the Ecoleaf registered mark for a certain product are limited to companies (business firms) that have acquired either the certified/registered/released product or the certified data collection system. If the relevant Ecoleaf certification is revoked for any reason, the company can no longer use the registered mark.

5.3: Design specifications of Ecoleaf registered mark

The standard color of the Ecoleaf registered mark is a white outline with a green background. Attention should be paid to the readability of the letters where the registered mark is reduced. To avoid being misunderstood, attention should also be paid when specifying the scope of the label for the Ecoleaf registered mark.

[Reference] Rules for the registration and disclosure of the Ecoleaf environmental label (R-09)

Chapter 6 Qualification and training for personnel for Ecoleaf environmental labeling program

6.1: Qualifications for data system verifiers

The following are criteria and requirements for verifiers (Cf. Section 4.2), who verify data collection systems available for integrating product environmental data:

① Scope of qualification criteria: The standard qualifications for auditors that applicants acquire to review data collection systems if they implement Ecoleaf labeling : the verifiers are appointed by the Ecoleaf environmental labeling office, which holds this program.

② Qualification criteria: Verifiers should satisfy the following criteria:

a. To certify that the person has fundamental knowledge and understanding of environmental management, as well as the methods and standards for environmental management, they have to acquire any of the following qualifications:
   - To hold the qualification of verifier for an environmental management system authorized by JEMAI;
   - To complete the training course and pass the proficiency test for environmental data verifiers at organizations authorized by JAB (Japan Accreditation Board for Conformity Assessment); and
   - To pass the proficiency test for environmental management auditors/verifiers conducted by JEMAI.

b. To meet the following requirement to certify that the person has basic knowledge of LCA calculations:
   - To pass the LCA proficiency test conducted by JEMAI.

c. To meet the following requirement to certify that the person has thorough knowledge of the methods, criteria, procedures and other rules for data verification in the Ecoleaf environmental label and the integration system for product environmental data, and he/she is capable of verifying the system:
   - To complete the training course on system verification in the Ecoleaf environmental labeling program conducted by JENAI.

③ Registration, renewal and invalidity of the qualification

a. Registration: The person qualified as a verifier by the Ecoleaf program office can be registered.
b. Term of validity: The qualification for verifier is valid for three (3) fiscal years commencing from the year registered.
c. Renewal: The registered system verifiers are required to achieve at least two system verifications per year, that is, six during the term of validity.
d. Invalidity: The Ecoleaf program office can suspend or disqualify the registration for the verifier who could not satisfy the requirement in (c) and/or contravenes with any of the compliances of the party concerned described in Chapter 8.

④ Performance obligations

a. Verifiers should examine the business operation system for integrating product environmental data in compliance with the verification rules in the Ecoleaf environmental labeling program (R-05), as directed by the Ecoleaf program office.
b. Verifiers should follow the qualifications and duties described in the verification rules in the Ecoleaf environmental labeling program (R-05) in verification work.
c. When system verification in the Ecoleaf environmental labeling program is completed, verifiers should prepare and submit without delay the results to the Ecoleaf program office. Results should be reported to the review panel and be placed under review.

⑤ Registration procedures

a. The application and registration procedures for qualified system verifiers are provided in the verification rules in the Ecoleaf environmental labeling program (R-05).
b. The Ecoleaf program office conducts all business concerning the qualification of system verifiers.

[Reference] Verification rules in the Ecoleaf environmental labeling program (R-05)

6.2: Qualification for auditors of product environmental data

The following is the qualification criteria and requirements for auditors of product environmental data.

The details on the criteria, requirements and procedures for qualification are available in the rules on auditing of product environmental data (R-07).

① Scope of qualification criteria: The standard qualifications for auditors who review data in PEAD (Product Environmental Aspects Declaration), PEIDS (Product Environmental Information Data Sheet) and product data sheets of products applying for Ecoleaf environmental labeling.

② Qualification criteria: Auditors should satisfy the following criteria:

a. To certify that the person has fundamental knowledge and understanding of environmental management (e.g. its concept and system), as well as the methods and standards for environmental management, they have to acquire any of the following qualifications:
   - To hold the qualification of auditor for an environmental management system authorized by JEMAI;
   - To complete the training course and pass the proficiency test for environmental auditors sponsored by JAB (Japan Accreditation Board for Conformity Assessment); and
   - To pass the proficiency test for environmental management auditors/verifiers conducted by JEMAI.
b. To meet the following requirement to certify that the person has basic knowledge of LCA calculation:
   - To pass the LCA proficiency test conducted by JEMAI.
c. To meet the following requirement to certify that the person has thorough knowledge of the methods, criteria, procedures and other rules necessary for the review of product environmental data in quantitative form as well as the integration system for such data, and he/she is capable of reviewing the integration system for product environmental data:
   - To complete the training course on system verification in the Ecoleaf environmental labeling program.

③ Registration, renewal and invalidity of the qualification

a. Registration: The person qualified as an auditor by the Ecoleaf program office can be registered.
b. Term of validity: The qualification for auditor is valid for three (3) fiscal years commencing from the year registered.
c. Renewal: The registered system auditors are required to achieve at least two system reviews per year, that is, six during the term of validity.
d. Invalidity: The Ecoleaf program office can suspend or disqualify the registration of the auditor who could not satisfy the requirement provided in (c), and/or contravenes with any of the compliances of the party concerned described in Chapter 8.

④ Performance obligations

a. Auditors should review environmental data in PEAD and PEIDS, in compliance with the audit rules of product environmental data (R-07), as directed by the Ecoleaf program office.
b. Auditors should follow the criteria for qualifications and duties described in the audit rules of product environmental data (R-07) in verification work.
c. When data review is completed, auditors should prepare and submit without delay the results to the Ecoleaf program office. Reports should be submitted to the review panel and be placed under review.

⑤ Registration procedures

a. The application and registration procedures for qualified auditors are provided in the verification rules in the Ecoleaf environmental labeling program (R-07).
b. The Ecoleaf program office conducts all business concerning the qualification of auditors.

[References] Verification rules in the Ecoleaf environmental labeling program (R-05)
Verification rules in the Ecoleaf environmental labeling program (R-07)
Compliance Rules for system verifiers and data auditors (R-12)

6.3: Training and proficiency tests for system verifiers and data auditors

The following are regulations on the proficiency tests on environmental management and LCA calculations, as well as training of system verification and data audit in the Ecoleaf environmental labeling program. The purpose of these activities is the cultivation of system verifiers and data auditors described in Section 6.1 and 6.2.

① Proficiency test on environmental management for system verifiers and data auditors

a. It is a written examination.
b. No particular qualification is necessary to take the test, although it is only for candidates who definitely intend to acquire and register the qualification for system verifier or data auditor.
c. The Ecoleaf program office conducts the qualification tests.
d. The grading system, standards and passing mark for the proficiency tests are described in the rules on tests and training personnel for Ecoleaf environmental labeling (R-13).

② LCA proficiency test

a. It is a written examination.
b. Candidates should satisfy the requirement provided in ②a in either Section 6.1 or Section 6.2.
c. The Ecoleaf program office conducts the proficiency tests.
d. The grading system, standards and passing mark for the proficiency tests are described in the rules on tests and training personnel for Ecoleaf environmental labeling (R-13).

③ Training of system verifiers and system data auditors for the Ecoleaf environmental labeling program

a. Training consists of lectures and role-playing.
b. Candidates should satisfy the requirement ②a in either Section 6.1 or Section 6.2., and pass the LCA proficiency test.
c. The Ecoleaf program office conducts the training.
d. Details on training (e.g. curriculum, timetable, learning materials including textbooks and requisites from instructors) and schedule are described in the rules on tests and training personnel for Ecoleaf environmental labeling (R-13).

[Reference] Rules on tests and training personnel for Ecoleaf environmental labeling (R-13)

Chapter 7 Support software and databases for the Ecoleaf environmental labeling program

The Ecoleaf program office provides support software used for Ecoleaf environmental labeling, as well as databases of shared intensities and characterization factors. This chapter describes the purposes, outlines and conditions for use of the software and databases.

7.1: Support software

7.1.1: Purpose of the provision of support software

Preparation of Ecoleaf environmental label can be rephrased to LCA calculations for product environmental data as following:

① Collection of original data required for LCA calculations
② Processing of collected data based on LCA methods
③ Data conversion available for LCA input
④ Mass calculation for inventory analysis and impact assessment of LCA data with intensity and characterization factor

From the above, procedures ③ and ④ can be computerized with the support software, which reduces the burden of Ecoleaf environmental labeling works. As data conversion and LCA calculation are securely operated by the same system without human errors, incidentally, adopting the support software can affect improvement in data reliability. It also reduces the burdens of verifying Ecoleaf environmental labels.

7.1.2: Service conditions of support software

Support software is loaned to participants in the Ecoleaf environmental labeling program at a price. Whole or part of the support software, which was developed solely for Ecoleaf environmental labeling, should only be used for its original purpose and never for any other purpose.

The support software, composed of operating system application, functions as follows:

Operating system processes and converts the input data in PEAD, PEIDS and product data sheets into the format available for LCA calculation. Then, the application program selects the intensity appropriate to the inventory analysis, which is then automatically executed. The appropriate characterization factor is also selected for an impact assessment which is then executed by the program.

7.2: Database

7.2.1: Purpose of the provision of database

There are two types of data provided in the Ecoleaf environmental label: specific product data in product data sheets; and numerical values with intensities used for inventory analysis, or characterization factor for impact assessment. The latter type of data varies with the scope, site, time and data researcher. Consequently, LCA results (provided in the Ecoleaf environmental label) vary considerably with the selection of inventory analysis and impact assessment, even when specific product data is researched accurately. The variation of intensity and characterization factor is one of the causes that interfere with the comparability of LCA calculation.

The database provides common intensities and characterization factors, for the purpose of eliminating variations in intensities and characterization factors applicable to inventory analysis and impact assessment, to ensure comparability of data in Ecoleaf environmental labels.

7.2.2: Database updating

As described in Section 3.3.3, released data should be used for data calculation to develop as much intensity as possible. It is necessary to review intensities periodically and upgrade to more reliable data as the need arises. Released data for characterization factors, similar to intensities, should be used as much as possible, with data requiring periodical review and upgrading if necessary.

7.2.3: Service conditions

Databases are provided for all participants in the Ecoleaf environmental labeling program when documentation for verification is requested. Similar to support software, databases are developed solely for Ecoleaf environmental labeling, and should only be used for its original purpose and never for other purposes.

[Reference] Rules on the use of support software and databases for the Ecoleaf environmental labeling program (R-14)

Chapter 8 Observances of the party concerned

8.1: Ethical norm for participants in the Ecoleaf environmental labeling program

To operate and manage the Ecoleaf environmental labeling program fairly, justly, and not favoring certain interests, ethics are required of members of the steering committee, PSC review committee, review committee, PSC-WG, and managers of the Ecoleaf program office. To accomplish this, the parties mentioned above are required to pledge to act ethically.
The required standards are stipulated in the rules on ethics for the Ecoleaf environmental labeling program (R-11).

8.2: Compliance for system verifiers and data auditors

Strict ethics are required for system auditors and verifiers, as they deal with classified information of participants in the Ecoleaf environmental labeling program, e.g. product manufacturing and marketing of participant companies. To accomplish this, compliance should be stipulated for system auditors and verifiers and made known to all parties concerned.
The rules on compliances for system verifiers and data auditors (R-12) describe compliances, as well as methods and procedures to be made known to parties concerned.

[References] Rules on ethics for the Ecoleaf environmental labeling program (R-11)
Rules on compliance for system verifiers and data auditors (R-12)

Chapter 9 Management of documents and records

In operating the Ecoleaf environmental labeling program, the documentation system is constructed to define documentation procedures, criteria and formats, as well as structure and operations of each system's component. The documentation system is managed and operated as follows.

9.1: Documentation system

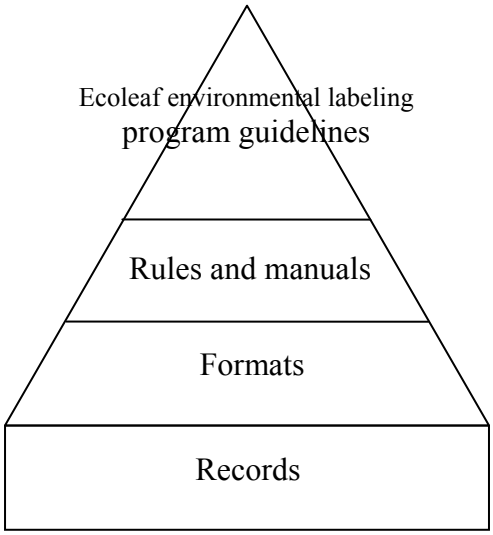
Shown in **Picture 9.1**, the system for documents and records used in the Ecoleaf environmental labeling program is a tier composed of three levels (primary, secondary and tertiary) of documentation or a level for records. The following is an outline of the documentation system.

As primary documentation, the Ecoleaf environmental labeling program guidelines are at the top. It provides the basic ideas for the purpose and outline of the program, as well as guidelines for preparing the Ecoleaf environmental label.

Rules and manuals are the secondary level. Documents define criteria and essentials for operating and managing the Ecoleaf environmental labeling program.

Formats in tertiary level define specific formats of rules and manuals.

Records at the bottom means that documents follow format in tertiary level. In operating the Ecoleaf environmental labeling program, used documents and formats should be the most recent and up-to-date.



Picture 9.1: Documentation system for the Ecoleaf environmental labeling program

9.2: Release of documentation

Rules and formats necessary for preparing Ecoleaf environmental labels (e.g. the guidelines) in principle are released. The difference between disclosed documents and undisclosed ones is stipulated in the rules on documentation management for the Ecoleaf environmental labeling program (R-01).

9.3: Disclosure procedures

The system for disclosure enables users of the Ecoleaf environmental labeling program to view and utilize the latest disclosed documents on JEMAI's website anytime.

[Reference] Rules on documentation management for the Ecoleaf environmental labeling program (R-01)

Chapter 10 Procedures for complaints and disputes

This Chapter defines management procedures for complaints and disputes caused by operations and results of the Ecoleaf environmental labeling program.

10.1: Complaint and dispute

The following are definitions of complaint and dispute:

① Complaint means the written claim where discontent or dissatisfaction is described.

② Dispute means the written objection to the Ecoleaf program office's response to a complaint.

10.2: Management procedures for complaints and disputes

The following are management procedures for complaints and disputes:

① Complaints concerning minor problems about paperwork and charges are managed by the person in charge of the Ecoleaf program office.

② Complaints and disputes concerning the management of the Ecoleaf environmental labeling program, established criteria and procedures, developed PSC and contents of released Ecoleaf environmental label are processed by the committee responsible as described below.

a. Steering committee: Management of the Ecoleaf environmental labeling program, and other matters which PSC review committee or Review committee are not responsible for.
b. PSC review committee: Matters concerning PSC.
c. Review committee: Matters concerning system verification and audits.

③ When a dispute occurs, the committee responsible decides on the policy and can set up a dispute management committee or review panel composed of appointed members from the committee responsible and entrust all responses by the review panel to the dispute.
The Ecoleaf program office should reply to the claimant of compliant/dispute within sixty (60) days commencing from the day filed.

10.3: Records of procedures for complaints and disputes

The Ecoleaf program office should prepare and maintain documentation to record the occurrence of complaints/disputes, as well as how it was handled and the results (including revision and improvement of the program).
The rules on complaint and dispute management for the Ecoleaf environmental labeling program (R-10) stipulate details.

[Reference] Rules on complaint and dispute management for the Ecoleaf environmental labeling program (R-10)

Chapter 11 Fee system for the Ecoleaf environmental labeling program

The following are classifications of fees concerning the Ecoleaf environmental labeling program.

① System certification fee
② Data verification fee (for external verification only)
③ Ecoleaf environmental label registration fee
④ Rental fee of support software (on request)
⑤ Training fee for system verifier and data auditor

The details are stipulate in the rules on fees for the Ecoleaf environmental labeling program (R-15).

[Reference] Rules on fees for the Ecoleaf environmental labeling program (R-15)

Appendix 3: Requirements for PSC (Product Specification Criteria) preparation

(Note 1) The requirements are developed solely for the Ecoleaf environmental labeling program, and neither all nor parts of it shall be used for any other purpose.
(Note 2) The "products" mentioned in this document include "processing service," that is, business dealing with recycling or reusing collected used products and waste material. Particulars for the requirements for processing service are partly different from those for general products.
(Note 3) Glossary
①Classification of raw material and product parts (parts/material) carried to manufacturing sites
Parts/material A: Parts/raw material whose eco-impact from processing and assembly (in preparation for manufacturing the product) are not required to be estimated with the common intensity provided by the Ecoleaf labeling program.
Parts/material B: Parts/raw material whose eco-impact from processing are required to be estimated with the common intensity provided by the Ecoleaf labeling program, while the eco-impact from assembly is not.
Parts/material C: Parts/raw material whose eco-impact from processing and assembly is required to be estimated with the common intensity provided by the Ecoleaf labeling program. See Section 3.4.1.
②Material classification criteria
The criteria to specify (classify) material available for calculating the eco-impact from producing materials. See Section 3.4.1.
③Deduction
It means subtracting the reduced eco-impact with the production of new materials and products from the eco-impact produced as a result of recycling and reuse.
④Intensity
In the Ecoleaf labeling program, intensity is defined as the physical amount of input/output material (e.g. mass, volume and calorie) per product unit, derived from consumed natural resources (e.g. iron ore and crude oil) and emitted eco-damaging substance (e.g. CO_2 and SOx). Intensity is divided into three types by applicable range: common; individual; and PSC. See Section 3.3.3 (1) b for details.

PSC Type Ⅰ(F-18-02): Requirements for the preparation of PSC

No.	Heading	Item	Subitem	Requirements
1	Prerequisites for PSC preparation	Product	Definition	Product specifications are defined by structure, functions, performance and processes.
2			Scope	Production scope is set based on the following: ① Mainframe that performs the product's functions ② Support material for wrapping and packing, and instruction manual.
3		Life cycle stage	Scope	The scope of adopting life cycle stages is established. (Note) In principle, entire life cycle stages are included. For certain products, e.g. general-purpose products and processing services with no manufacturing, the selection of stages should be appropriate to product features.
4	Product data sheet (for LCI input)	Data on manufacturing stage (product data)	Product materials or raw materials	Mass calculation method for product materials or raw materials are prepared by specifying applicable requirements, based on the following requirements by type of product. Regardless of product type, missing (uncollected) data is processed based on cutoff rules provided in No.13. Ⅰ Products excluding processing service ① Raw materials and product parts carried to manufacturing site are classified as Parts/materials A, B or C, based on the definition in this form. ② Parts/materials A should be determined among raw materials and product parts. ③ Parts/materials B and C should be clearly separated. ④ Amount of raw materials and product parts attributed to manufacturing sites should be provided. If data for input amounts is not available, the amount should be estimated with material composition and the mass balance at manufacturing site. ⑤ Material specification criteria should be stipulated for materials and intermediate materials. Ⅱ Processing service ① Processing objectives should be specified. ② Material specification criteria should be stipulated for materials of the processed objective. With open recycling and reused parts, the following can be added to the data based on appropriate scenario set by the company. ① Indirect impact ② Deduction The appropriateness of the scenario setting is verified.

5	Product data sheet (for LCI input)	Data on manufacturing stage (manufacturing site data)	Inputted/consumed/ emitted material and energy	Based on the following requirements, amounts of materials and energy inputted, consumed and emitted at manufacturing sites are estimated, with the applicable requirements. ① Input/consumption/emission items should be defined. ② Among emission items, materials recycled outside the company should be defined and handled as follows. a) valuables b) wasted/recycled material ③ Transportation requirements should be determined for material input (e.g. material and energy), wasted/recycled and processed (by processing service). (Note) In case the transportation of the input material to site is included in the intensity, Item ③ can be ignored. The eco-impact by industrial waste (e.g. slag, scrap, waste catalyst and irregulars) directly emitted from manufacturing site is included in the use stage. Used materials by consumers are included in the disposal/recycling, although it is categorized in the processing stage (corresponding to the stage used) for processing service.
6		Data on logistics stage	Requirements for product transportation	Transportation requirements (e.g. its method, distance and loading rate) should be stipulated and base specified. (Note) In principle, for general-purpose products (e.g. log, motor and compressor for general purpose), only the manufacturing stage is included (Cf. No.3). Consequently, the transportation stage is not applicable to such products. Likewise, it is not included for processing service. Where overseas manufacturing is included, the eco-impact by overseas transportation is added to domestic transportation. Each company can set overseas transportation based on the actual situation, although appropriateness should be verified.
7		Data on use stage	Service conditions of products	Based on the following settings, requirements for service conditions of products should be determined and base indicated. The conditions do not apply to general-purpose products and processing service whose use stage is not subject to LCA. ① Service conditions for use (including consumption and emission items) ② Quantity of consumables and replacements required in the used stage, as well as the disposal/recycling requirements

8	Data on manufacturing stage	Data on disposal/recycling stage	Requirements for product disposal/recycling	Ⅰ Products excluding processing service The scenario is set for disposal/recycling stage of product and the base is indicated. Each of the

			data	following items should be set for the scenario to specify requirements for disposal/recycling stage. Requirements do not apply to general-purpose products whose subject of LCA is limited to the manufacturing stage. ① Scenario should be set for disposal, recycling, reuse and preparation. ② Scenario should be set for deduction. ③ Criterion should be set for recycling/reuse possibility of components/parts. ④ Product collection rate should be set. Achieved collection rate based on results per product η_1(Note 1) can be applied as well as specified collection rate η_2(Note 2) provided with its base in PSC unit. ⑤ Reused number (N) should be set. Other requirements appropriate to specific products can be substituted, although its base should be specified. ⑥ Calculation method should be specified for the eco-impact by processing used products either to waste without recycling or reused, or for sale as valuables. ⑦ Among open recycling/reusing parts, the following can be added to the data based on appropriate scenario set by the company. (1) Indirect impact (2) Deduction The appropriateness of the scenario setting is verified. (Note 1) Formula for calculating amount of reused parts: Reused amount = Amount possible for reuse × η_1 × N / (N + 1) (Note 2) η_1 = (Total of collected amount of specific product)/(Total production amount of specific product) η_2 = Fixed amount based on appropriate base (e.g. fixed industry average for the product whose achieved collection rate is hard to specified) Ⅱ Processing service Calculation criteria for reduced eco-impact with reuse/recycling should be determined and specifying the base.

9	Product Environmental Information Declaration Sheet (PEIDS)	Inventory analysis	LCI formulas	Prerequisites for LCA calculation should be determined as follows: ① Intensity is allotted to each main material/parts and specifying its base. (See No.14 for details.) ② Each lifecycle stage is examined whether it is necessary to set a formula for the stage. Based on the examination, a) A specific formula should be proposed if necessary and specifying its base. b) Preparation of original intensity for the formula should be proposed if necessary, and presenting the reason. If the open part is included, it is divided into direct and indirect eco-impacts for LCI calculation: the indirect impact should be expressed as the "effect by recycling," with the breakdown provided as an explanatory note. Total of indirect effects are provided in the "effect by recycling" section in PEIDS, and the breakdown is provided as an explanatory note.
10		Impact assessment	Additional impact category	Whether additional categories are necessary besides the impact categories in the list of common characterization factors are examined. If necessary, names of categories to be added are listed with the material to be categorized and specifying the bases. (See N0.16 for characterization factors applied to material.)
11	Breakdown Datasheet (related to product data sheets)	Data processing	Allocation	Although the basis is to establish methods that require no allocation, but if necessary, the allocation method for site data should be determined: ① Fundamentals of allocation (area, amount of shipment and output) ② Allocation details (scope, representativeness and completeness)
12		Data collection	Range of data collection	Range of data collection should be set for the following items. In doing so, representativeness is considered. ① Collection site (e.g. domestic, overseas and representative factory) ② Collection period (e.g. year, quarter and month)
13		Data collection	Cutoff rules	In compliance with cutoff rules provided in JISQ14041, application criteria are defined as follows: ① Objectives inapplicable to cutoff should be determined. ② Criterion (margin of cutoff) should be defined. ③ Cutoff procedures, parts and consumed/emitted material should be determined. ④ Cutoff indicators (e.g. mass, energy and eco-impact) should be determined.

14	Breakdown Datasheet (related to PEIDS)	Database	Selection of common intensities	Applicable common intensities should be selected in compliance with the list of LCI common intensities.

15	Breakdown Datasheet (related to PEIDS)	Database	Additional intensities	Where existing common intensities are inapplicable (or there is no appropriate intensity), new intensities can be established by considering the following: ① Specifications for new intensities should be determined. ② Either PSC intensities or individual intensities can be chosen. (Note) New intensities should meet the requirements provided in the Ecoleaf environmental labeling program guidelines, as well as rules of data verification in the Ecoleaf environmental labeling program.
16			Additional characterization factor	Where inventory items provided in the list of common characterization factors are insufficient for eco-impact assessment, whether to establish new inventory factors are examined.
17	Product environmental data	Product specifications		Specific items (including processing service) are defined.
18		Data for release		① Required items (provided in 3.2.5 (1) in the guidelines), excluding eco-impact items for disclosure, should be determined. ② Lifecycle stages for data release are individually decided. ③ Representation (e.g. document, chart or graph) should be examined. If open recycling/reused part is included, actual eco-impact is not combined with displayed eco-impact, and the breakdown of the effects is provided as an explanatory note.
19	Other environmental data	Selective data to be entered		Verifiable environmental information is provided and may be decided if not involved with any of the following,: a) Environmental labeling (categorized in Type Ⅰ and/or Type Ⅲ) b) ISO 14001 certification c) Other certification, authorization, or commendation given by the government or industrial organizations Conditions for use of toxic substance may also be included. In that case, the scope of life cycle stage, members and materials should be decided.

(Note 1) The requirements are developed solely for Ecoleaf environmental labeling program, and shall not be used for any other purpose, as a whole or partly.

(Note 2) Terminology

①Classification of raw material and product parts (parts/material) carried to manufacturing site

There are three types: parts/material A, B and C, each are defined in Section 3.4.1 in the Ecoleaf environmental labeling program guidelines.

②Material classification criteria

See Section 3.4.1 of the guidelines.

③Deduction

It means subtracting the reduced eco-impact with the production of new materials and products from the eco-impact produced as a result of recycling and reuse.

④Intensity

See Section 3.3.3 (1) b of the guidelines.