

# CASBEE<sup>®</sup> for Market Promotion

Comprehensive Assessment System for Built Environment Efficiency

● Technical Manual (2014 Edition)

For Offices and Retails

— reflecting UNEP FI PWG's support for concise metrics —

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Published by :

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建築環境・省エネルギー機構  
Institute for Building Environment and Energy Conservation

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## PART I. Outline of CASBEE for Market Promotion

### 1. Background of study

The Comprehensive Assessment System for Built Environment Efficiency (CASBEE) is an assessment tool used in Japan. As of November 2013, CASBEE has been used by 24 local governments nationwide to review application for building permits. More than 11,000 assessment results have been submitted to local governments as of the end of March 2013. CASBEE for Building (New Construction) that covers new buildings has steadily become popular; however, CASBEE tools have not yet been widely used in property appraisal in terms of existing buildings.

The "CASBEE Property Appraisal Manual" was released in February 2010 in order to address this issue. The manual focuses on the relationship between the CASBEE assessment items and property pricing factors and was designed to obtain reference data on property appraisals. However, some parties in the property appraisal field felt that this manual was too detailed for practical use. Improving convenience in use was also another new issue.

We sometimes receive inquiries about the evaluation compatibility between CASBEE, LEED (Leadership in Energy & Environmental Design), etc., when overseas investors and foreign tenants examine Japanese property. Furthermore, the United Nations Environment Programme - Sustainable Building and Climate Initiative (UNEP-SBCI) has been working to create world common indicators that focus on items such as energy use, greenhouse gas (GHG) emissions, water use, resources, waste, indoor environment, biodiversity, and economics. Meanwhile, the United Nations Environment Programme Finance Initiative Property Working Group (UNEP FI PWG) has proposed the creation of a simple and cost-free tool with high compatibility.

On the other hand, since environment efficiency items are usually included in the framework of existing laws and standards, such as the Energy Conservation Law, earthquake-resistance standards for the Building Standard Law, and the Act on Maintenance of Sanitation in Buildings in Japan, utilizing this framework is also considered effective, in terms of a simple and cost-free assessment of environment efficiency.

In light of the above, in order to combine assessment factors associated with construction and site in CASBEE, and to further illuminate the link with CASBEE's property appraisal for market players, "CASBEE for Market Promotion" was released in May 2012 for their use.

Further, upon revising the 2014 edition this time, the contents and assessment items have been revised to include retail stores in scope of the assessment.

Building environmental efficiency assessment tools may be used in various aspects as follows:

- Design support tool
- Public administration support tool
- Real estate branding tool
- Check list (including a tool for what users noticed), etc.

While CASBEE for Building (New Construction) is mainly used as a design support tool and public administration support tool, CASBEE for Market Promotion is mainly positioned as a real estate branding tool and check list.

Figure I.1 shows the frequency distribution of buildings in the property market according to environmental efficiency. Buildings having a standard level of environmental efficiency are distributed in the center of the chart. Buildings with a higher level of performance are regarded as eco-buildings, and those which may even create innovation come on top of all that.

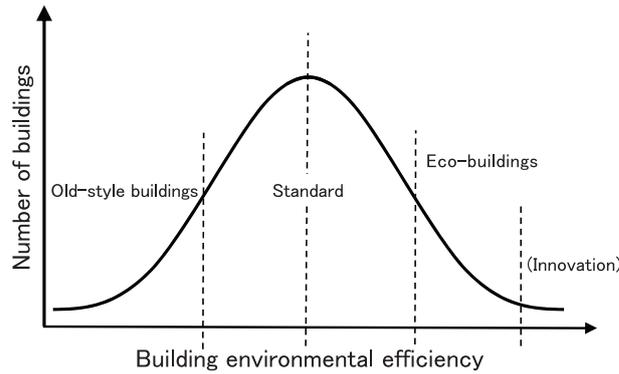


Figure I.1 Frequency distribution of building environmental efficiency in the real estate market (illustrative view)

As for buildings whose levels of environmental efficiency are below standard, laws and regulations would be necessary since the minimum performance level has to be maintained. The guideline is to encourage an increase in the current level of performance. (Figure I.2)

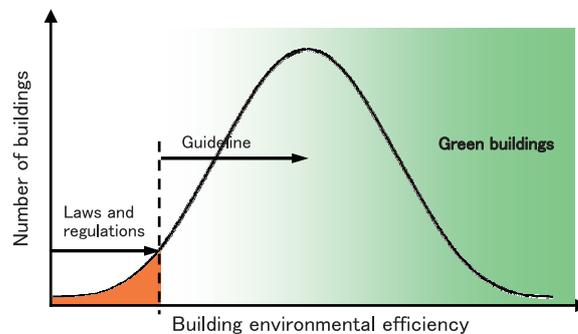


Figure I.2 Building environmental efficiency, laws and regulations, guideline, and position of green buildings (illustrative view)

When utilizing other CASBEE tools such as CASBEE for Building as a public administration support tool, any building should be covered in the assessment. When utilizing CASBEE for applications for subsidies or some sort of incentives, for example, if B+ or over was required, CASBEE would be positioned as a branding tool.

The U.S. LEED, which is a branding tool that covers only about the top 25% of superior buildings in the scope of the certification, has a different purpose. As the performance level increases, the rating progresses from the standard certification, silver prize, gold prize up to the platinum prize. (Figure I.3)

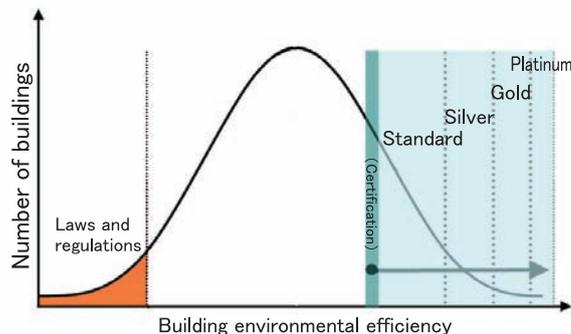


Figure I.3 Frequency distribution of building environmental efficiency in LEED (illustrative view)

Since CASBEE for Market Promotion only covers buildings that satisfy required items in the scope of the certification, it is positioned as a branding tool for real estate. It may also be used as a check list in which the environmental efficiency of existing buildings is evaluated in a simplified manner, prompting its users to recognize new issues. The required items in CASBEE for Market Promotion are basically as follows:

1. Energy use/GHG emissions
  - Meeting the energy conservation standards (Level 3 or higher in any of the old standard, new standard and actual values)
  - Setting target energy consumption and carrying out monitoring
2. Water
  - Setting target water consumption and carrying out monitoring
3. Materials/Safety
  - Complying with the new earthquake resistance standard (after the 1981 standard)
  - Buildings constructed before the Building Standard Law was revised in 1981, and seismic renovations have been completed  
(The structural seismic index for seismic retrofitting  $I_s$  value is 0.6 and over, or the collapse risk index  $I_f$  value is 1.0 and under.)
4. Biodiversity/Land use
  - Avoiding invasive alien species, uncategorized alien species and suspicious alien species rather than introducing them voluntarily
5. Indoor environment
  - Complying with the management standard of environmental sanitation for buildings (in terms of temperature, humidity, airflow, dust, carbon monoxide and carbon dioxide)
  - In cases where the gross floor area is less than 3,000 m<sup>2</sup>, an assessment based on questionnaires would be appropriate.

In terms of buildings located across the country including small- and medium-sized ones, those which satisfy all the required items in CASBEE for Market Promotion are positioned as illustrated in Figure I.4.

We assume that buildings in compliance with requirements are in the top 30 to 40%, which is based on the frequency of buildings across the nation that meet the legal standard of seismic capacity and have a higher level of energy efficiency than the energy conservation standards. As the energy efficiency increases, the rating proceeds from Certification B with 2 stars (the required items satisfied), B+ with 3 stars (Good), A with 4 stars (Very good) and up to S with 5 stars (Excellent). Accordingly, CASBEE for Market Promotion is positioned as a branding tool that certifies compliance with the requirements.

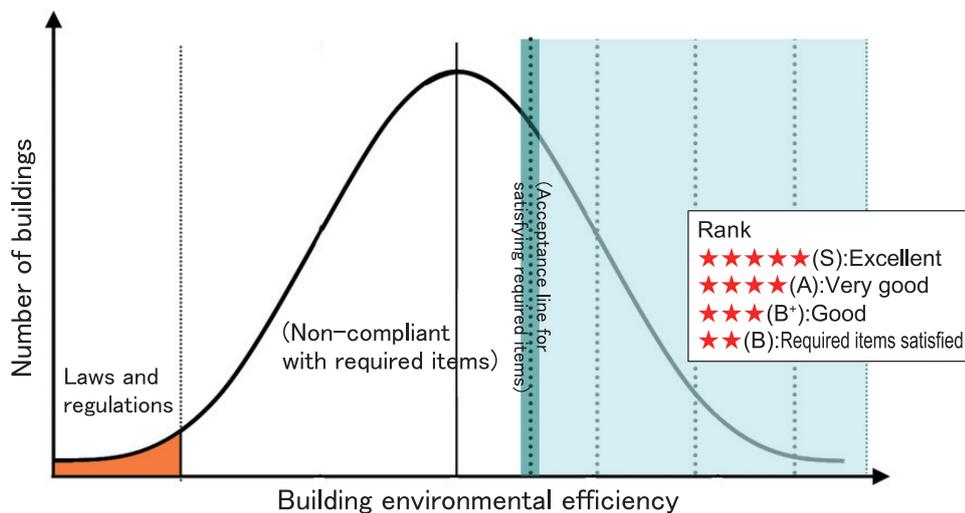


Figure I.4 Frequency distribution of building environmental efficiency in CASBEE for Market Promotion (illustrative view)

## 2. Basic policies for CASBEE for Market Promoton

In light of the background described above 1, CASBEE for Market Promotion was developed in accordance with the following basic policies.

- Encompass items proposed by UNEP-SBCI and items which are compatible with CASBEE, LEED, and other rating systems.
- The number of assessment items is reduced as much as possible.
- By combination with a support tool, it establishes the linkage to property appraisal.
- It effectively utilizes the framework of existing laws and standards, such as building health standards, housing performance indication system, and the Recycling Law.
- It establishes a mechanism (certification and training systems) which can widely be used by property market players.
- CASBEE assessments provided by conventional CASBEE tools, including CASBEE for Building (New Construction) and CASBEE for Building (Existing Building), are not required.

### 3. Dissemination to the international community

#### 3.1 Details of dissemination

In view of the proposal by the UNEP FI PWG regarding the need of creating a simple, costless and highly compatible tool described in 1, CASBEE Sub-Committee on Property Assessment Review conducted a review on CASBEE for Market Promotion. This study is considered necessary for other overseas assessment tools. Therefore, as shown in the figure below, we have been introducing CASBEE for Market Promotion at international conferences such as the UNEP FI PWG, since October 2010 to stimulate discussion.

Ideally, in the future, all rating systems would share common metrics as illustrated in figure below and also include each country's particular items, such as earthquake resistance in Japan. Every system could connect to property appraisal. Furthermore, rating systems for a Design for Environment (DfE) and for investors could coexist, as planners and contractors need elaborate systems, while investors need simpler systems.

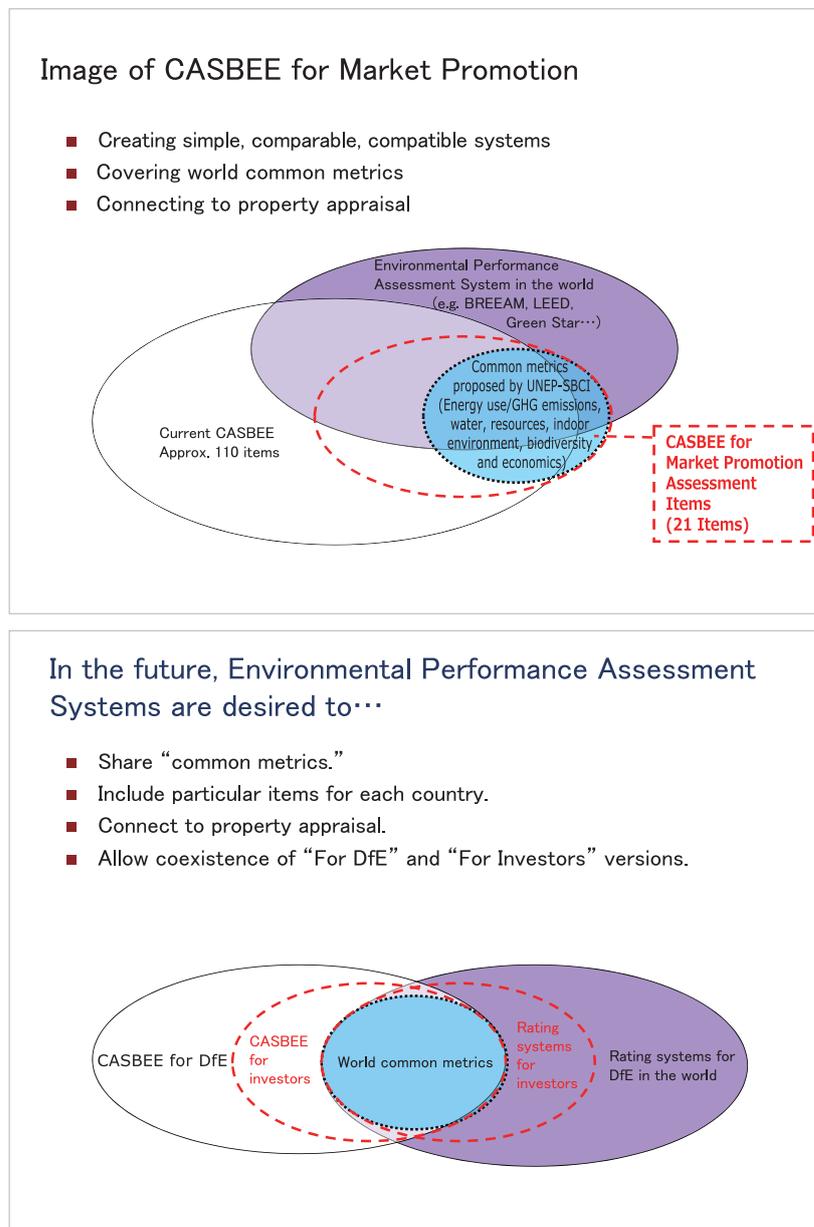
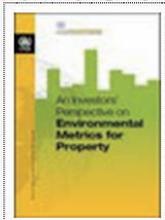


Figure I.5: Image of CASBEE for Market Promotion

### 3.2 Response to dissemination

The report, "An Investor's Perspective on Environmental Metrics for Property", has been prepared by the UNEP FI PWG and discusses matters, such as the dissemination of information, as described above. Initiation of a study on CASBEE for Market Promotion, as well as a study on the abridged versions of LEED and BREEAM in the US and Europe, are introduced.

 [An Investors' Perspective on Environmental Metrics for Property](#)  
(668 KB | 12 pages)



This study urges the integration of environmental metrics for the property investment industry

In Japan CASBEE has begun discussions with market participants regarding an abridged version of CASBEE metric (the CASBEE for Market Promotion tool.) In the US and Europe, LEED and BREEAM are also beginning to release 'short-form' versions of their better known measurement schemes, for existing stock.

Figure I.6 Excerpt from the UNEP FI PWG report

The study of CASBEE for Market Promotion has been well received by the UNEP FI PWG, which supports the Responsible Property Investment (RPI), focusing on Environment/Society/Governance (ESG). The tentative version was given the subtitle "reflecting UNEP FI PWG's support for concise metrics." The UNEP FI newsletter issued in November 2011 also features the English version of CASBEE for Market Promotion (tentative version) published in October the same year. Information dissemination like this is considered to be very important for an environment efficiency assessment tool to become acceptable to investors worldwide.



UNEP Finance Initiative Newsletter
November 2011

**CASBEE releases tool on green property financing**

The [CASBEE for Market Promotion](#) comes after a recent call by the [UNEP FI Property Working Group](#) to bridge the gap that separates financial and environmental experts and move the dialogue on environmental metrics for property investment forward.

More information [here](#).

Contact us  
For further information, contact [communications \[at\] unepfi.org](mailto:communications@unepfi.org).

Figure I.7 Excerpt from the UNEP FI website

### 3.3 About GRESB

There is an international benchmark in terms of individual estate agents and estate managers (on a portfolio basis) called the Global Real Estate Sustainability Benchmark (GRESB). "Green building certification," one of the survey items in the GRESB, lists CASBEE for Building (New Construction), CASBEE for Building (Existing Building) and CASBEE for Building (Renovation) as major certification tools both for new construction and existing buildings, in which points are added in the assessment through the survey. In the 2013 survey, CASBEE for Market Promotion was also approved as an official tool.

## 4. Outline of Sustainable Building (SB) Index Proposed by UNEP-SBCI

In 2009 Common Carbon Metrics (CCM) was launched at COP15. Without global consensus, there is confusion in the market, undermining efforts to fully implement promotion of sustainable buildings. In creating the framework of CCM, UNEP-SBCI first focuses on climate change as its top priority. The UNEP-SB Index will provide a globally consistent framework to understand, measure, report, and verify actual building performance on core sustainability issues. The index is not intended to be a rating system, but rather intended to steer and focus building industry stakeholders on the primary issues agreed upon by the leaders and decision-makers of the sector.

The index is expected to focus on measurable, reportable and verifiable (MRV) indicators, and be applicable to existing residential and non-residential buildings.

The index reportedly includes aspects of the buildings' impact and benefits in regard to the following six issues. A review committee consists of a Steering Committee (SC) and Technical Advisory Committees (TACs) for each respective issue. In addition to the SC, TACs for Energy Use/GHG emissions, Water use and Resources have thus far begun operating.

Table I.1 Items of UNEP SB Index

Issue	Indicator	Unit
Energy use/GHG emissions Energy/ GHG	Energy intensity Carbon intensity	kWh/m <sup>2</sup> /yr kg-CO <sub>2</sub> e/m <sup>2</sup> /yr or kg-CO <sub>2</sub> e/person/yr
Water Use Water	Rain and sanitary water harvested and treated/used on and off site (recycling water use)	mL/m <sup>2</sup> /yr
Resources Materials	Use of recycled materials in construction	% by mass
Indoor Environment Quality (IEQ) Indoor Environmental Quality (IEQ)	Indoor air pollutions level Lighting for suitable tasks Noise Thermal comfort	Pollutant level/m <sup>3</sup> Lux dB PMV index
Biodiversity and Land Use	Previously used site, avoiding green field site, is selected	Yes/No (Target: Zero or positive impacts on biodiversity)
Economics	Although including life cycle cost (LCC) as a criterion has been proposed, no agreement has been reached as to whether an economic indicator is to be included in the index.	US\$/m <sup>2</sup> /yr (calculation)

Source: Briefing draft of SB index (excerpt from the material distributed at UNEP-SBCI SB symposium on May 19-20, 2010)

## 5. Assessment Items of CASBEE for Market Promotion

### 5.1 Position of CASBEE for Market Promotion

The conventional CASBEE family is a group of tools that enable building designers and other related parties to evaluate accurately the building environmental efficiency, whereas CASBEE for Market Promotion was developed as "a branding tool for real estate" that allows market players to conduct a quick and simple assessment in order to encourage broad use thereof in the real estate market. As a result, both the new tool and those already on the market are designed to coexist and to be used or executed selectively, depending on the purpose. On the other hand, buildings evaluated by CASBEE for Market Promotion could also undergo the existing CASBEE assessments afterwards, which is rather desirable.

The following figure shows the positioning of CASBEE for Market Promotion among other CASBEE tools.

Unlike the existing design tools such as CASBEE for Building (New Construction), CASBEE for Building (Existing Building) and CASBEE for Building (Renovation), "CASBEE for Market Promotion" is a simplified assessment tool intended for property market players. Property market players include investors, financial institutions, real estate companies, building owners, brokers, tenants and licensed real estate appraisers. The present tool has selectively incorporated the bare minimum, essential items used in the current CASBEE tools for new construction, existing building, etc. Some items used in CASBEE for Sustainable Site, which are considered important from the viewpoint of property appraisal, have also been adopted.

We also plan to develop an "economic efficiency evaluation tool" as supplementary material to connect environmental performance indicators to property value appraisal.

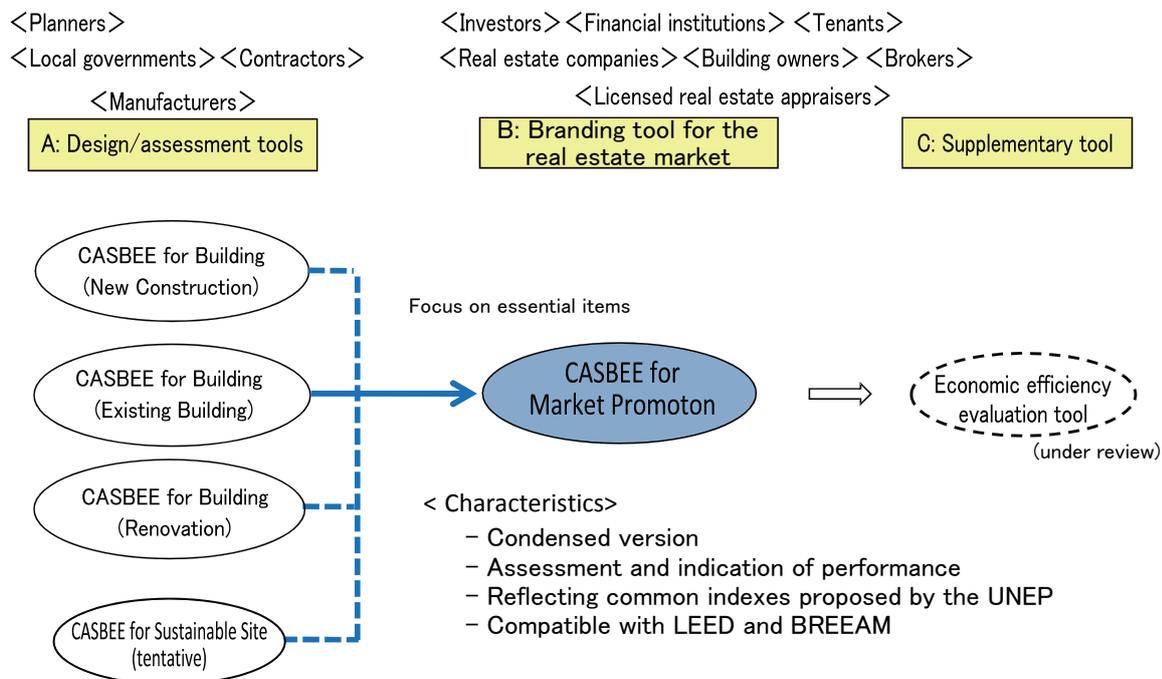


Figure I.8 Position of CASBEE for Market Promotion among CASBEE tools

## 5.2 Weights in Assessment

Based on an exchange of opinions with The Real Estate Companies Association of Japan, Japan Building Owners and Managers Association, Japan Association of Real Estate Appraisers and Sustainable Property Study Group, as well as in consideration of balancing with the weights assigned in other major foreign assessment tools, and the current CASBEE five-point scale evaluation method, CASBEE for Market Promotion is designed to have a maximum score of 100 points as detailed below:

- [1] Consistency with the weights assigned in other major assessment tools throughout the world
- [2] Point scoring system (not BEE indication used in the existing CASBEE)
- [3] Five required items and 16 additional items for a total of 100 points
- [4] Mandatory required items (excluded from assessment if not satisfied)
- [5] UNEP-SBCI itemized system (not current CASBEE systems such as Q-1 to 3 and LR-1 to 3)
- [6] 60 points when standard score of 3 points is earned for all additional point items and 100 points when 5 points are earned; 1 extra point for owner-tenant joint initiatives with rental buildings

The rating method is as follows:

- Satisfying required items ★★ (equivalent to B- of the current CASBEE)  
 Points scored  $\geq 60$  ★★★ (equivalent to B+ of the current CASBEE)  
 Points scored  $\geq 66$  ★★★★ (equivalent to A of the current CASBEE)  
 Points scored  $\geq 78$  ★★★★★ (equivalent to S of the current CASBEE)

Table I.2: Weights Assigned to Items of Major Assessment Tools in the World

	LEED-NC (USA)	BREEAM (UK)	Green Star (Australia)	Green Mark (Singapore)	CASBEE for Building (New Construction) (Japan)	CASBEE for Market Promotion
Sustainable site	26	8 (Transport) 10 (Land use & Ecology) 10 (Pollution)	11 (Transport) 8 (Land use) 19 (Emissions)	7 (Transport) 8 (Greenery) 3 (Storm)	$0.3(Q3) + 0.3 \times 0.67(LR3) = 0.50$ (25)	20 (Biodiversity/Land use)
Water use	10	6	12	17	$0.3 \times 0.15(LR2) = 0.045$ (2.25)	10 (Water Use)
Energy use/GHG emissions	35	19	29	116	$0.4(LR1) + 0.3 \times 0.33(LR3) = 0.50$ (25)	35 (Energy Use/GHG emissions)
Material/Durability & Reliability	14	12.5 7.5 (Waste)	22	8 (Products) 2 (Refrigerants)	$0.3 \times 0.85(LR2) + 0.3(Q2) = 0.555$ (27.75)	20 (Materials/Safety)
Indoor Environment Quality	15	15	27	8	$0.4(Q1) = 0.4$ (20)	15 (Indoor Environment)
Management	N.A.	12	12	7	N.A.	N.A.
Innovation	6	10	5	7 (Innovation) 10 (Construct)	N.A.	N.A.
Region	4	N.A.	N.A.	N.A.	N.A.	N.A.
Total	110	110	145	190	2.0(100)	100

N.A.: Not Applicable



Figure I.9 Weights Assigned to Assessment Items per Tool (Pie Chart)

### 5.3 Assessment Items

#### 5.3.1 Principles for designing assessment items based on the basic principles

Among the basic principles described in Section 2, those which are related to the assessment items for CASBEE for Market Promotion are listed as follows:

- Items proposed by UNEP-SBCI and items which are compatible with CASBEE, LEED, and other rating systems are extensively incorporated.
- Assessment items are narrowed down as much as possible.
- By combination with a support tool, it establishes the linkage to property appraisal.
- It effectively utilizes the framework of existing laws and standards, such as building health standards, housing performance indication system, and the Recycling Law.

According to the basic principles above, those for designing the assessment items are defined as follows.

Table I.3 Principles for designing assessment items

Basic principles	Principles for designing assessment items
Items proposed by UNEP-SBCI and items which are compatible with CASBEE, LEED, and other rating systems are extensively incorporated.	<ul style="list-style-type: none"> <li>➤ World's common items (Energy use/GHG emissions, Water use, Resources, Biodiversity, Indoor environment) are set as main assessment item categories. Assessment items under consideration for the Sustainable Building Index proposed by the UNEP-SBCI are respectively included in the above categories.</li> <li>➤ Individual categories consist of "required items" and "additional items" adopted in LEED and BREEAM.</li> <li>➤ Balancing with the weights assigned in LEED and BREEAM is considered (See 3.3 above)</li> <li>➤ Regeneration of brownfield sites and public transportation accessibility, valued in LEED and other tools, are included in the assessment items.</li> </ul>
Assessment items are narrowed down as much as possible.	<ul style="list-style-type: none"> <li>➤ Limit the number of items to approximately 20 in total</li> </ul>
By combination with a support tool, it establishes the linkage to property appraisal.	<ul style="list-style-type: none"> <li>➤ In addition to world's common items, important environment efficiency aspects which greatly impact the property value of buildings in Japan (Disaster prevention/Safety, Durability, Self-sufficiency, Natural disaster risk management) are included in the assessment items.</li> <li>➤ Regarding Energy use and Water use, the "calculated value" which indicates the original environment efficiency of buildings and the "measured value" are combined and set as assessment items.</li> <li>➤ The weight of the "calculated value" is larger than that of the "measured value". (Though the measured value is weighed heavily as a world common metric, it largely depends on the user characteristics and use method. Hence more importance is placed on the calculated value based on building efficiency.)</li> <li>➤ The assessment items for Indoor environment include items relating to "natural symbiosis" (Use of daylight, Natural ventilation, View), the effect of intellectual productivity adjusted to biodiversity has become increasingly important.</li> </ul>
It effectively utilizes the framework of existing laws and standards, such as building health standards, housing performance indication system, and the Recycling Law.	<ul style="list-style-type: none"> <li>➤ Compliance with legal standards relating to the Energy Conservation Law, new earthquake-resistance standards for the Building Standard Law, the Invasive Alien Species Act, and the Act on Maintenance of Sanitation in Buildings, is essential. (Regardless of application or if there are punitive laws, compliance with legal standards is required in the general sense.)</li> </ul>

### 5.3.2 List of assessment items

Table I.4 shows a list of assessment items for CASBEE for Market Promotion based on the principles described in Section 5.3.1. Based on the world's common items and taking into account items particularly important in Japan, five categories are established such as "Energy Use/GHG Emissions," "Water Use," "Materials/Safety," "Biodiversity/Land Use" and "Indoor Environment". Each has required items to be satisfied. In the "Biodiversity/Land Use" category, "Soil environmental quality," "Public transportation accessibility" and "Natural disaster risk management" have been added as land use items.

This tool has two aspects: one to evaluate environmental performance and the other to disclose environmental performance value (index). The real estate market needs clear indication of environmental performance, and it is important to disseminate such idea.

In addition to the list of assessment items for office buildings, a separate list for stores is shown in Tables I.5 and I.6. The list for stores allows an assessment of the actual energy consumption in Energy/GHG emissions and that of the actual water consumption in stores in Water use. In Materials/Safety, a new item concerning the waste disposal load control has been added. In Indoor environment, standards for daylight use and natural ventilation have been modified for store use. The assessment item View has been revised to View/Visual environment to fit stores, and its standard has been reviewed.

### 5.3.3 Legality and required items

This tool has required items for each main category. It aims to verify that the legality of the important items, and confirms their conformance to legal standards in a broad sense, in order to ensure the required environmental performance (see below).

Table I.4 Legality and Required Item

Category	Legal standards (mandatory for all)	Legal standards (mandatory for concerned parties)	Legal standards (reasonable effort)
Energy/GHG Emissions	-	Energy Conservation Law (Energy conservation standards for new construction) Tokyo Metropolitan Ordinance on Environmental Preservation (Reduction in total emissions*)	Energy Conservation Law (Reduction in carbon intensity*)
Water use	-	-	-
Materials/Safety	Waste Disposal Law + regulations (proper separation, storage, collection, transport, recycling, disposal, etc.)	New earthquake resistance standards for the Building Standard Law (reinforcement of earthquake resistance standards after 1981)	-
Biodiversity/Land use	Invasive Alien Species Act (prohibition on raising, planting, storing, carrying, and importing specified alien species)	Invasive Alien Species Act (Registration of importation of uncategorized alien species)	"Request for understanding and cooperation in proper handling" by the Ministry of the Environment (MOE) (alien species requiring caution in handling)
Indoor Environment	Industrial Safety and Health Act (office health standards)	Act on Maintenance of Sanitation in Buildings (Building environment and health control standards)	Health Promotion Act (evaluation standards regarding separate smoking area effect) Act on Maintenance of Sanitation in Buildings (Building environment and health control standards)

\* The reduction in total emissions or intensity differs in nature from responsibility for environmental performance.

Table I.5 CASBEE for Market Promotion (Office) Assessment Items

Category		Item	Unit of Measurement	Measurement and Assessment Methods	Point(s)
1. Energy use/GHG emissions	Prereq.	Compliance with energy conservation standards, target setting and monitoring, and establishment of an operation management system	Primary energy: MJ/m <sup>2</sup> /yr	New item (Monitoring methods and the operation management system refer to the current CASBEE standards.)	Reqd and additional 1 point
	1.1	Energy Intensity/Carbon Intensity (calculated)	Primary energy: MJ/m <sup>2</sup> /yr Secondary energy: kWh/m <sup>2</sup> /yr CO <sub>2</sub> : kg-CO <sub>2</sub> /m <sup>2</sup> /yr	New item (based on the primary energy specified by various calculation tools, PAL and CEC)	15~25
	1.2	Energy Intensity/Carbon Intensity (measured)	Primary energy: MJ/m <sup>2</sup> /yr Secondary energy: kWh/m <sup>2</sup> /yr CO <sub>2</sub> : kg-CO <sub>2</sub> /m <sup>2</sup> /yr	New item (assessment according to the positioning of measured statistical values)	1~5
	1.3	Natural Energy (Photovoltaic power generation, etc.)	%	New item (ratio of maximum power consumption or annual energy consumption)	1~5
2. Water	Prereq.	Target setting and monitoring	L/m <sup>2</sup> /yr	New item	Reqd
	2.1	Water Intensity (calculated)	L/m <sup>2</sup> /yr	New item (calculate the potable water usage)	1~5
	2.2	Water Intensity (measured)	L/m <sup>2</sup> /yr	New item (assessment of the positioning of measured statistical values)	1~5
3. Materials/Safety	Prereq.	Disaster prevention/Safety		New earthquake resistance standards or, reinforcement to a seismic structural index (I <sub>s</sub> ) > 0.6 or, an axial durability for a falling index (I <sub>f</sub> ) < 1.0	Reqd
	3.1	High quake-resistance/Seismic Isolation, etc.		Current CASBEE standards	1~5
	3.2	Use Ratio of Recycled Materials (number of structural and non-structural items where recycled materials are used)	Number of recycled materials	New item (current CASBEE standards)	1~5
	3.3	Service Life of Structure Materials	Year	Current CASBEE standards	1~5
	3.4	Ease of MEP Renewal/Increase in Self-sufficiency of building services/ Maintenance	Year Number of efforts for an increase in self-sufficiency Number of efforts in maintenance	Current CASBEE standards /New item	1~5
4. Biodiversity/Land use	Prereq.	Avoid alien and invasive Fauna & Flora (specified, unclassified and caution required)		New item	Reqd
	4.1	Preservation & Creation of Biodiversity (conservation, restoration, management of ecological resources, and securing the quantity & quality of greening for the present)	Number of efforts to enhance biodiversity	New item (current CASBEE standards)	1~5
	4.2	Soil Environmental Quality/Regeneration of Brownfield Sites		New item (draft standards for CASBEE for Sustainable Site)	1~5
	4.3	Public Transportation Accessibility		New item (draft standards for CASBEE for Sustainable Site)	1~5
	4.4	Natural disaster risk management	Total number of risks	New item (draft standards for CASBEE for Sustainable Site)	1~5
5. Indoor environment	Prereq.	Standards for Sanitation Maintenance in Buildings		Confirm availability of measurement documents	Reqd
	5.1	Use of Daylight	Window ratio (%) Number of building services using daylight	Refer to current CASBEE standards	1~5
	5.2	Natural Ventilation Performance	Opening space for natural ventilation (cm <sup>2</sup> /m <sup>2</sup> )	Refer to current CASBEE standards	1~5
	5.3	Perceived Spaciousness & Access to View	Ceiling height	Current CASBEE standards	1~5
				Total point	100

Items of Sustainable Building Index (draft) proposed by UNEP-SBCI

Table I.6 CASBEE for Market Promotion (Store) Assessment Items

Category		Item	Unit of Measurement	Measurement and Assessment Methods	Point(s)	Matters for consideration
Energy use/ GHG emissions	Prereq.	Compliance with energy conservation standards, target setting and monitoring, and establishment of an operation management system	Primary energy: MJ/m <sup>2</sup> /yr	New item (Monitoring methods and the operation management system refer to the current CASBEE standards.)	Reqd and additional 1 point	Apply the Office edition
	1	Energy Intensity/Carbon Intensity (calculated)	Primary energy: MJ/m <sup>2</sup> /yr Secondary energy: kWh/m <sup>2</sup> /yr CO <sub>2</sub> : kg-CO <sub>2</sub> /m <sup>2</sup> /yr	New item (based on the primary energy specified by various calculation tools, PAL and CEC)	15~25	Apply retailers and restaurants for the assessment of calculated values in both the old and new standards. Areas for retailers, restaurants and office administration are divided proportionally by the floor space.
	2	Energy Intensity/Carbon Intensity (measured)	Primary energy: MJ/m <sup>2</sup> /yr Secondary energy: kWh/m <sup>2</sup> /yr CO <sub>2</sub> : kg-CO <sub>2</sub> /m <sup>2</sup> /yr	New item (assessment according to the positioning of measured statistical values)	1~5	Utilize DECC data.
	3	Natural Energy (Photovoltaic power generation, etc.)	%	New item (ratio of maximum power consumption or annual energy consumption)	1~5	Apply the Office edition
Water	Prereq.	Target setting and monitoring	L/m <sup>2</sup> /yr	New item	Reqd	Apply the Office edition
	1	Water Intensity (calculated)	L/m <sup>2</sup> /yr	New item (calculate the potable water usage)	1~5	Calculation of water consumption in stores
	2	Water Intensity (measured)	L/m <sup>2</sup> /yr	New item (assessment of the positioning of measured statistical values)	1~5	Utilize DECC potable water data.
Materials/Safety	Prereq.	Disaster prevention/Safety		New earthquake resistance standards or, reinforcement to a seismic structural index (I <sub>s</sub> ) > 0.6 or, an axial durability for a falling index (IF) < 1.0	Reqd	Apply the Office edition
	1	High quake-resistance/Seismic Isolation, etc.		Current CASBEE standards	1~5	Apply the Office edition
	2	2 Rate of utilization of recycled materials /Waste disposal load control	Number of initiatives for reducing waste	New item (current CASBEE standards)	2~10	Evaluate efforts for reducing waste in stores
	3	Service Life of Structure Materials	Year	Current CASBEE standards	1~5	Apply the Office edition
	4	Ease of MEP Renewal/Increase in Self-sufficiency of building services/ Maintenance	Year Number of efforts for an increase in self-sufficiency Number of efforts in maintenance	Current CASBEE standards /New item	1~5	Apply the Office edition
Biodiversity/Land use	Prereq.	Avoid alien and invasive Fauna & Flora (specified, unclassified and caution required)		New item	Reqd	Apply the Office edition
	1	Preservation & Creation of Biodiversity (conservation, restoration, management of ecological resources, and securing the quantity & quality of greening for the present)	Number of efforts to enhance biodiversity	New item (current CASBEE standards)	1~5	Apply the Office edition
	2	Soil Environmental Quality/Regeneration of Brownfield Sites		New item (draft standards for CASBEE for Sustainable Site)	1~5	Apply the Office edition
	3	Public Transportation Accessibility		New item (draft standards for CASBEE for Sustainable Site)	1~5	Apply the Office edition
	4	Natural disaster risk management	Total number of risks	New item (draft standards for CASBEE for Sustainable Site)	1~5	Apply the Office edition
Indoor environment	Prereq.	Standards for Sanitation Maintenance in Buildings		Confirm availability of measurement documents	Reqd	Record information about stores larger than 3,000 m <sup>2</sup> . Utilize a questionnaire in the following cases (same as offices).
	1	Use of Daylight	Window ratio (%) Number of building services using daylight	Refer to current CASBEE standards	1~4	Evaluate whether there is a window for natural light, open top mall, open-air terrace and the like, as well as the opening ratio.
	2	Natural Ventilation Performance	Opening space for natural ventilation (cm <sup>2</sup> /m <sup>2</sup> )	Refer to current CASBEE standards	1~4	Evaluate whether there is a window for natural ventilation, open top mall and open-air terrace, and the like.
	3	View/Visual environment	Ceiling height	Current CASBEE standards	1~2	Evaluate whether there is a window that provides an outside view.
				Total point	100	

Items of Sustainable Building Index (draft) proposed by UNEP-SBCI

### 5.4 Position of the assessment in the market

CASBEE for Market Promotion is positioned as a branding tool in the real estate market, which covers any building across the country including small- and medium-sized ones in the assessment. Its position is slightly different from design tools such as CASBEE for Building (Existing building) and the like. This tool's primary requirement is to satisfy required items. As long as the requirement is met, a certain certification rank is determined (For the required items, see PART II. Assessment standard). When points obtained increase as additional points are scored, a higher rank is appointed in the rating. The assessment standard is as follows:

S: ★★★★★	Excellent	≥ 78 points
A: ★★★★	Very Good	≥ 66 points
B+: ★★★	Good	≥ 60 points
B: ★★	Required items satisfied	≥ 50 points

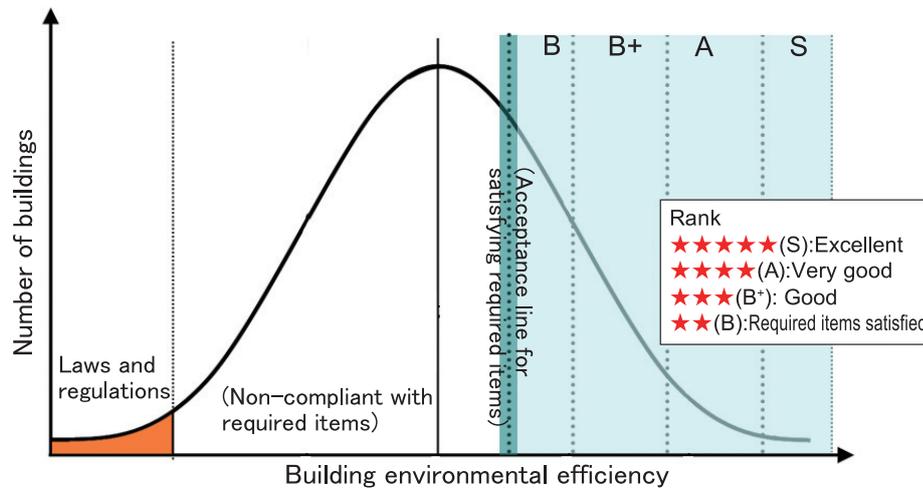


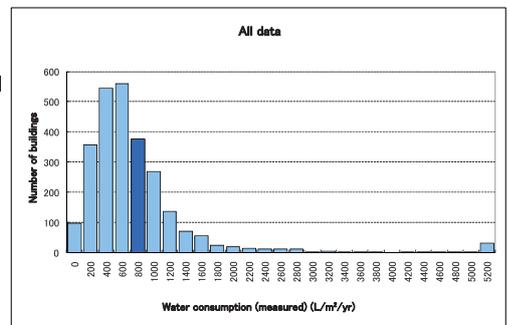
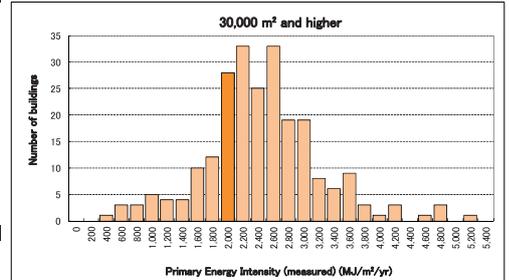
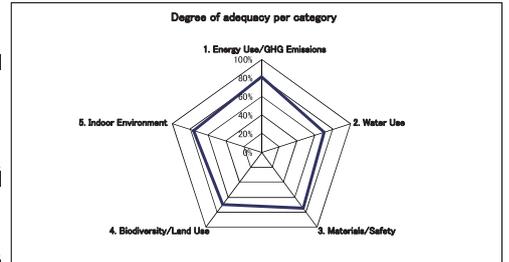
Figure I.10 Rating of a building subject to the assessment in CASBEE for Market Promotion (illustrative view)

### 5.5 Assessment Example

An assessment example is shown in Figure I.11. The required items must be satisfied, and additional items are evaluated based on the points earned according to the criteria. The total additional points are shown in the upper column of the assessment sheet, and the number of stars (☆) indicates the rating.

In the right column, a cobweb chart displaying five categories, the position of measured energy consumption in statistics, statistical data of potable water usage, and a summary of the characteristics of environment efficiency, have been added. Use of the right column is optional, but it is recommended so to offer market officials a more comprehensive and easy-to-understand presentation of environmental information regarding the building.

CASBEE <sup>®</sup> for Market Promotion [Office]   Assessment Results		Assessment manual used: CASBEE for Market Promotion (2014 version) Prototype v1.0	
<b>Building overview</b>			
Name of building: XX Building	Site area: 8,000 m <sup>2</sup>	Stage of assessment: Building in operation	Building in operation
Building site: XXXXXX, XX City, XX Prefecture	Building area: 8,300 m <sup>2</sup>	Date of assessment: 20XX/XX/XX	20XX/XX/XX
Land use zone: Commercial zone, fire-prevention district	Total floor area: 50,000 m <sup>2</sup>	Created by: XXX	XXX
Use of building: Office	Number of floors: XX floors above ground	Property appraiser no.:	
Date of completion: 19XX/XX/XX	Construction: Reinforced concrete	Date of approval: 20XX/XX/XX	
Date of recent major renovation: 20XX/XX/XX	Average number of residents: XXX person	Approved by: XXX	
	Annual hours of use: XXX hrs/yr	Property appraiser no.:	
<b>Assessment results</b>			
76.3 / 100 Total (pts scored / max.)		Rank S: ☆☆☆☆	78
☆☆☆☆☆		Rank A: ☆☆☆	66
		Rank B+: ☆☆☆	60
		Rank B-: ☆☆☆	50
		Rank C: ☆	50
<b>1. Energy Use/GHG Emissions</b>			
Compliant	Prerequisite	Indicator	Assessment value
1.0	Compliance with energy conservation standards, target setting, monitoring operations management system	Indicator (* = reference value)	Assessment value
20.0	Criteria etc.: PAL and CEC results were unsatisfactory. Checked the measured annual progresses and compared with the benchmark. The energy-saving target was jointly set with the tenants.	Primary energy (target)	1,850 MJ/m <sup>2</sup> /yr
3.0	1.1 Energy intensity/carbon intensity (calculated)	Primary energy (planned)	1,554.0 MJ/m <sup>2</sup> /yr
5.0	Criteria etc.: Energy consumption of air conditioning, lighting, ventilation, hot water supply and elevators. Secondary energy values are for reference.	Secondary energy (*)	159.0 kWh/m <sup>2</sup> /yr
5.0	1.2 Energy intensity/carbon intensity (measured)	Carbon intensity (*)	68.0 kg-CO <sub>2</sub> /m <sup>2</sup> /yr
5.0	Criteria etc.: Total energy consumption of the entire building. Data centers located on two floors out of 10.	Primary energy (measured)	2,031.0 MJ/m <sup>2</sup> /yr
29.0	1.3 Natural energy	Secondary energy (*)	208.0 kWh/m <sup>2</sup> /yr
36	Criteria etc.: Photovoltaic power generation: output 100 kW (12%)	Carbon intensity (*)	89.0 kg-CO <sub>2</sub> /m <sup>2</sup> /yr
		Rate of utilization	12.0 %
<b>2. Water Use</b>			
Compliant	Prerequisite	Indicator	Assessment value
4.0	Target setting, monitoring, operations management system	Indicator	Assessment value
3.0	Criteria etc.: Checked the measured water consumption.	Water consumption (target)	680.0 L/m <sup>2</sup> /yr
7.0	2.1 Water intensity (calculated)	Water intensity (planned)	680.0 L/m <sup>2</sup> /yr
10	Criteria etc.: Including the use of rain water.	Water intensity (measured)	800.0 L/m <sup>2</sup> /yr
	2.2 Water intensity (measured)		
	Criteria etc.: Including the use of rain water.		
<b>3. Materials/Safety</b>			
Compliant	Prerequisite	Indicator	Assessment value
5.0	Compliance with new earthquake resistance standards or I <sub>0</sub> = and II= and III=	Indicator	Assessment value
3.0	Criteria etc.: Renovation completed to achieve I <sub>0</sub> > 0.6	None	
5.0	3.1 High earthquake resistance, seismic isolation, etc. Based on points of Item [1] or [2], whichever is higher		
2.0	[1] Earthquake-resistance		
3.0	[2] Seismic isolation & vibration damping system		
3.0	3.2 Use of recycled materials. Based on average points of Items [1] and [2]		
1.0	[1] Building frame applications	Number of recycled materials	0 item(s)
5.0	[2] Non-structural applications		
3.0	3.3 Service life of structural materials		
3.0	Criteria etc.: Equivalent to Class 3 of the housing performance indication system	Service life elapsed plus remaining	75 year(s)
3.0	3.4 MEP equipment renewal/Self-sufficiency improvement of building services/maintenance		
4.0	[1] MEP equipment (Renewal planned at 10-year intervals)	Average years of renewal interval	15 year(s)
2.0	[2] Safety services system (over etc.)	Number of self-sufficiency measures	3 point(s)
	[3] Maintenance	Number of maintenance measures	3 point(s)
15.0			
20			
<b>4. Biodiversity/Land Use</b>			
Compliant	Prerequisite	Indicator	Assessment value
3.0	No alien or invasive fauna and flora used (specified, unclassified, and caution required)	Indicator	Assessment value
4.0	Criteria etc.: Compliance with the Invasive Alien Species Act (planting, importing, etc.) and inspection by AIC (controlling, class species, which require caution when handling)	None	
4.0	4.1 Creation and preservation of biodiversity		
3.0	Criteria etc.: Vegetation plan developed with consideration of natural vegetation in surrounding area	Point(s) based on list of initiatives (2)	1 point(s)
3.0	4.2 Soil environmental quality/regeneration of brownfield sites		
3.0	Criteria etc.: Conducting soil survey, (if applicable for land character change, preventing pollution and removing pollutants)	None	
4.0	4.3 Public transportation accessibility		
5.0	Criteria etc.: 10 minute walk from the train station	None	
4.0	4.4 Natural disaster risk prevention		
5.0	Criteria etc.: No risk of liquefaction, tsunami, earth fissure or lightning strike. Effective countermeasures against risk of flood or seismic movement in place	Total number of risks	2 type(s)
14.0			
20			
<b>5. Indoor Environment</b>			
Compliant	Prerequisite	Indicator	Assessment value
3.3	Compliance with the Sanitation Management Standards for Building or questionnaire	Indicator	Assessment value
3.0	Criteria etc.: Retention of compliance records pertaining to the Sanitation Management Standards for Building	None	
4.0	5.1 Daylighting		
4.0	[1] Use of natural light	Window ratio of 14%	14.0 %
4.0	[2] Daylight devices	Number of daylight devices	1 type(s)
4.0	5.2 Natural ventilation performance		
5.0	Criteria etc.: Available opening area 1/29 of the floor space of a room		
4.0	5.3 Perceived space and access to view		
5.0	Criteria etc.: Windows in place offering all occupants sufficient view of outside	Height of ceiling	2.0 m and higher
11.3			
15			



**Characteristics of environment efficiency:**

- Due to the energy saving performance of the building and energy saving attempts in operation, high points are obtained in Energy Use/GHG Emissions.
- Due to frequent and detailed maintenance, renewal intervals exceed the statutory service life, achieving high points in assessment items of Materials/Safety.
- Measured water consumption exceeds the expected consumption value based on the facility specifications and the number of people in the building. Further efforts to reduce consumption is recommended.
- Due to the excellent accessibility to public transport services and a low risk of natural disasters, high points are obtained in assessment items of Biodiversity/Land Use.
- Due to the large aperture and natural ventilation areas, high points are obtained in Indoor Environment.

Name of evaluation agency/Name of assessor

Name of certification authority

Figure I.11 Assessment example of CASBEE for Market Promotion

## 5.6 Assessment Results Sheet

An example of an assessment results sheet is shown in Figure I.12. Points are filled in by the assessor.

The assessor gives an overview of the building and enters the score for each item, basis of assessment, and values. The evaluation results are added up and a rating is indicated by the number of stars (☆). The assessment result sheets for certified buildings are made available to the public by the certification authority.

# CASBEE<sup>®</sup> for Market Promotion [Office] Assessment Results

Assessment manual used: CASBEE for Market Promotion (2014 version)

v1.0

Building overview		Site area	XXX	m <sup>2</sup>	Stage of assessment	Building in operation
Name of building	XX Building	Building area	XXX	m <sup>2</sup>	Date of assessment	20XX/XX/XX
Building site	XXXXXXXX, XX City, XX Prefecture	Total floor area	XXX	m <sup>2</sup>	Created by	XXX
Land use zone	Commercial zone, fire-prevention district	Number of floors	XX floors above ground		Property appraiser no.	XXX
Use of building	Office	Construction	Reinforced concrete		Date of approval	20XX/XX/XX
Date of completion	19XX/XX/XX	Average number of residents	XXX	person	Approved by	XXX
Date of recent major renovation	20XX/XX/XX	Annual hours of use	XXX	hrs./yr	Property appraiser no.	

Assessment results		Rank S	Rank A	Rank B+	Rank B-	Rank C
0,0	/100 Total	★★★★★	★★★★	★★★	★★	★
(pts scored	/max.)	IV	IV	IV	IV	<
Points shown to one decimal place		78	66	60	50	50

1. Energy Use/GHG Emissions		Indicator (* = reference value)	Assessment value
Assessment	Maximum points		
0,0	25	Prerequisite: Compliance with energy conservation standards, target setting, monitoring, operations management system	
Additional 1 pt		Criteria etc.	
5		1.1 Energy intensity/carbon intensity (calculated)	Primary energy (target) MJ/m <sup>2</sup> /yr
		Criteria etc.	
5		1.2 Energy intensity/carbon intensity (measured)	Primary energy (planned) MJ/m <sup>2</sup> /yr
		Criteria etc.	Secondary energy (*) kWh/m <sup>2</sup> /yr
			Carbon intensity (*) kg-CO <sub>2</sub> /m <sup>2</sup> /yr
5		1.3 Natural energy	Primary energy (measured) MJ/m <sup>2</sup> /yr
		Criteria etc.	Secondary energy (*) kWh/m <sup>2</sup> /yr
			Carbon intensity (*) kg-CO <sub>2</sub> /m <sup>2</sup> /yr
0,0	36	1.3 Natural energy	Rate of utilization %
		Criteria etc.	
0,0	36	Total	

2. Water Use		Indicator	Assessment value
Assessment	Maximum points		
0,0	10	Prerequisite: Target setting, monitoring, operations management system	
5		Criteria etc.	
5		2.1 Water intensity (calculated)	Water consumption (target) L/m <sup>2</sup> /yr
		Criteria etc.	
5		2.2 Water intensity (measured)	Water intensity (planned) L/m <sup>2</sup> /yr
		Criteria etc.	Water intensity (measured) L/m <sup>2</sup> /yr
0,0	10	Total	

3. Materials/Safety		Indicator	Assessment value
Assessment	Maximum points		
0,0	5	Prerequisite: Compliance with new earthquake resistance standards or Is- and If-values	
		Criteria etc.	なし
0,0	5	3.1 High earthquake resistance, seismic isolation, etc. Based on points of Item [1] or [2], whichever is higher	
		[1] Earthquake-resistance	
		[2] Seismic isolation & vibration damping systems	
0,0	5	3.2 Use of recycled materials Based on average points of Items [1] and [2]	
		[1] Building frame applications	
		[2] Non-structural applications	Number of recycled items (non-structural) item(s)
5		3.3 Service life of structural materials	Service life elapsed plus remaining year(s)
		Criteria etc.	
0,0	5	3.4 MEP equipment renewal/Self-sufficiency improvement of building services/Maintenance Based on average points of Items [1] to [3]	
		[1] MEP equipment	Average years of renewal interval year(s)
		[2] Building services systems (power, etc.)	Number of self-sufficiency measures point(s)
		[3] Maintenance	Number of maintenance measures point(s)
0,0	20	Total	

4. Biodiversity/Land Use		Indicator	Assessment value
Assessment	Maximum points		
0,0	5	Prerequisite: No alien or invasive fauna and flora used (specified, unclassified, and caution required)	
		Criteria etc.	None
5		4.1 Creation and preservation of biodiversity	Point(s) based on list of initiatives (2) point(s)
		Criteria etc.	
5		4.2 Soil environmental quality/regeneration of brownfield sites	None
		Criteria etc.	
5		4.3 Public transportation accessibility	None
		Criteria etc.	
5		4.4 Natural disaster risk prevention	Total number of risks type(s)
		Criteria etc.	
0,0	20	Total	

5. Indoor Environment		Indicator	Assessment value
Assessment	Maximum points		
0,0	5	Prerequisite: Compliance with the Sanitation Management Standards for Building or questionnaire	
		Criteria etc.	None
0,0	5	5.1 Daylighting [(Item [1] pt (s) x 2/3) + (Item [2] pt (s) x 1/3)]	
		[1] Use of natural light	Window ratio %
		[2] Daylight devices	Number of daylight devices type(s)
5		5.2 Natural ventilation performance	
		Criteria etc.	
5		5.3 Perceived space and access to view	Height of ceiling m and higher
		Criteria etc.	
0,0	15	Total	

XX Building

Figure I.12 Assessment result sheet for CASBEE for Market Promotion (Office building)

# CASBEE<sup>®</sup> for Market Promotion [Retail] Assessment Results I

Assessment manual used: CASBEE for Market Promotion (2014 version)

v1.0

Building overview			
Name of building	XX Building	Site area	m <sup>2</sup>
Building site		Building area	m <sup>2</sup>
Land use zone	Commercial zone, fire-prevention district	Total floor area	m <sup>2</sup>
Use of building		Number of floors	
Date of completion		Construction	
Date of recent major renovation	None	Average number of residents	XXX, XXX person
		Annual hours of use	XXX hrs/yr
		Stage of assessment	Building in operation
		Date of assessment	20XX/XX/XX
		Created by	
		Property appraiser no.	
		Date of approval	20XX/XX/XX
		Approved by	
		Property appraiser no.	

Assessment results			
0.0 / 100 Total		Rank S : ★★★★★	78
(pts scored / max.)		Rank A : ★★★★	66
Points shown to one decimal place		Rank B+ : ★★★	60
		Rank B- : ★★	50
		Rank C : ★	50

1. Energy Use/GHG Emissions			
Assessment	Maximum points	Indicator (= reference value)	Assessment value
Compliant	Prerequisite	Compliance with energy conservation standards, target setting, monitoring, operations management system	
	Criteria etc.		
	Additional 1 pt	Primary energy (target)	MJ/m <sup>2</sup> /yr
	25	1.1 Energy intensity/carbon intensity (calculated)	
	Criteria etc.	Primary energy (planned)	MJ/m <sup>2</sup> /yr
		Secondary energy (*)	kWh/m <sup>2</sup> /yr
		Carbon intensity (*)	kg-CO <sub>2</sub> /m <sup>2</sup> /yr
	5	1.2 Energy intensity/carbon intensity (measured)	
	Criteria etc.	Primary energy (measured)	MJ/m <sup>2</sup> /yr
		Secondary energy (*)	kWh/m <sup>2</sup> /yr
		Carbon intensity (*)	kg-CO <sub>2</sub> /m <sup>2</sup> /yr
	5	1.3 Natural energy	
	Criteria etc.	Rate of utilization	%
0.0	36	Total	

2. Water Use			
Assessment	Maximum points	Indicator	Assessment value
Compliant	Prerequisite	Target setting, monitoring, operations management system	
	Criteria etc.		
	5	2.1 Water intensity (calculated)	L/m <sup>2</sup> /yr
	Criteria etc.	Water consumption (target)	
		Water intensity (planned)	L/m <sup>2</sup> /yr
	5	2.2 Water intensity (measured)	
	Criteria etc.	Water intensity (measured)	L/m <sup>2</sup> /yr
0.0	10	Total	

3. Materials/Safety			
Assessment	Maximum points	Indicator	Assessment value
Compliant	Prerequisite	Compliance with new earthquake resistance standards or Is- and If-values	
	Criteria etc.		
0.0	5	3.1 High earthquake resistance, seismic isolation, etc.	Based on points of Item [1] or [2], whichever is higher
		[1] Earthquake-resistance	
		[2] Seismic isolation & vibration damping systems	
	10	3.2 Utilization of recycled materials/Control of waste disposal load	Based on points to which Utilization of recycled materials (Maximum points: 5, average points of Items [1] and [2]) and Control of waste disposal load (Maximum points: 5) is added
		[1] Building frame applications	
		[2] Non-structural applications	
		Control of waste disposal load	
5.0		Number of recycled items (non-structural)	item(s)
5.0			point(s)
5.0		3.3 Service life of structural materials	
		Criteria etc.	Service life elapsed plus remaining
			year(s)
0.0	5	3.4 MEP equipment renewal/Self-sufficiency improvement of building services/Maintenance	Based on average points of Items [1] to [3]
		[1] MEP equipment	Average years of renewal interval
		[2] Building services systems (power, etc.)	Number of self-sufficiency measures
		[3] Maintenance	Number of maintenance measures
			point(s)
			point(s)
0.0	25	Total	

4. Biodiversity/Land Use			
Assessment	Maximum points	Indicator	Assessment value
Compliant	Prerequisite	No alien or invasive fauna and flora used (specified, unclassified, and caution required)	
	Criteria etc.		
	5	4.1 Creation and preservation of biodiversity	
		Criteria etc.	Point(s) based on list of initiatives (2)
			point(s)
	5	4.2 Soil environmental quality/regeneration of brownfield sites	
		Criteria etc.	None
	5	4.3 Public transportation accessibility	
		Criteria etc.	None
	5	4.4 Natural disaster risk prevention	
		Criteria etc.	Total number of risks
			type(s)
			2 risks (flood and ground motion), 1 measure
0.0	20	Total	

5. Indoor Environment			
Assessment	Maximum points	Indicator	Assessment value
Compliant	Prerequisite	Compliance with the Sanitation Management Standards for Building or questionnaire	
	Criteria etc.		
0.0	4	5.1 Daylighting	[(Item [1] pt (s) x 2/3) + (Item [2] pt (s) x 1/3)]
		[1] Use of natural light	Window ratio
		[2] Daylight devices	Number of daylight devices
			%
			type(s)
	4	5.2 Natural ventilation performance	
		Criteria etc.	
	2	5.3 View/Visual environment	
		Criteria etc.	Height of ceiling
			3.0~3.5 m and higher
0.0	10	Total	

XX Building

Figure I.13 Assessment result sheet for CASBEE for Market Promotion (Retail)

## 5.7 Basis of assessment form

In addition to entering results in the assessment sheet, the items in the basis of assessment form must be filled out. The form also serves as a checklist for accompanying documents required for assessment applications and can be used in preparation for submission.

<b>Basis of assessment</b>	
<p>Check the box or describe where appropriate in the "Basis of assessment/attached documents" column. Provide as detailed a description as possible of the reasons.            Items marked with an asterisk (*) are mandatory fields and must be completed.            Submission of documents marked with two asterisks (**) are also mandatory.            Check the box corresponding to each document that you are submitting (when submitting accompanying documents, only the excerpt that is specific to the basis of the assessment is required, not all the documents).</p>	
<b>1. Energy/GHG emissions</b>	
	Basis of assessment/attached documents
<b>【Prerequisite】</b>	
[1] Compliance with the energy conservation standards	* Basis of compliance:
[2] Energy intensity target setting	* Measured value: (MJ/m <sup>2</sup> /yr) * Targeted value for the following year: (MJ/m <sup>2</sup> /yr)
[3] Monitoring	* Monitoring details:
[4] Development of building operation management system	* Summary of building operation management system:  [Additional 1 pt] Description of owner-tenant joint initiatives for energy conservation if any:  <input type="checkbox"/> Building operation management system chart **
<b>【Additional point(s)】</b>	
1.1 Energy intensity/carbon intensity (calculated)	Select supporting documents to be attached from the list below: <input type="checkbox"/> Copy of energy-saving plan <input type="checkbox"/> Copy of primary energy consumption calculation sheet <input type="checkbox"/> Copies of Building Environment Plan and initiative evaluation as per TMG Green Building Program <input type="checkbox"/> Copy of calculation using other tool (tool name: ) <input type="checkbox"/> Other (if using statistical average) <i>-applicable only when none of the above is available</i>
1.2 Energy intensity/carbon intensity (measured)	<input type="checkbox"/> List of measured energy/potable water consumption**
1.3 Natural energy	<input type="checkbox"/> Design drawing, calculation sheet, performance data of applicable systems, etc.
<b>2. Water use</b>	
	Basis of assessment/attached documents
<b>【Prerequisite】</b>	
[1] Water consumption target setting	* Measured: (L/m <sup>2</sup> /yr) * Targeted value for the following year (L/m <sup>2</sup> /yr)
[2] Monitoring Implementation	*Monitoring details:  <input type="checkbox"/> Water conservation operation system chart **
<b>【Additional point(s)】</b>	
2.1 Water Intensity (calculated)	<input type="checkbox"/> Results using office building water use calculation software ** <input type="checkbox"/> Documents pertaining to sanitation device specifications and effluent data
2.2 Water Intensity (measured)	<input type="checkbox"/> List of measured energy /potable water consumption **

Figure I.14 Basis of Assessment Form (1 of 5)

<b>3. Materials/Safety</b>	
	Basis of assessment/attached documents
【Prerequisite】 One of the following items [1] to [3] should be satisfied.	
[1] Compliance with the new earthquake-resistance standards (for buildings constructed after the introduction of 1981 standards)	Year of completion:
[2] Structural seismic index (Is-value) 0.6 or more (for buildings constructed before the introduction of 1981 standards and seismic renovation has been completed)	<input type="checkbox"/> Data showing building's Is-value
[3] The index of falling (If-value) is 1.0 or less (for buildings constructed before the introduction of 1981 standards and seismic renovation has been completed)	<input type="checkbox"/> Data showing building's If-value
【Additional point(s)】	
<b>3.1 High earthquake-resistance, seismic isolation, etc.</b>	
[1] Earthquake-resistance	Level 4 or 5 requires one of the following pieces of documentation: <input type="checkbox"/> Data showing earthquake-resistance level <input type="checkbox"/> Data showing margin of horizontal load-bearing capacity <input type="checkbox"/> Data showing time-history earthquake response analysis results <input type="checkbox"/> Data showing building's damage-control design (for Level 5)
[2] Seismic isolation & vibration damping systems	Level 4 or 5 requires the following piece of documentation: <input type="checkbox"/> Data showing installment of seismic isolation/vibration damping systems
<b>3.2 Utilization of recycled materials/Control of waste disposal load</b>	
<b>3.2.1 Utilization of recycled materials</b>	
[1] Use of recycled materials in structural frame applications	Level 5 requires the following pieces of documentation (refer to the manual for applicable items): <input type="checkbox"/> List of recycled materials used (structural frame applications) (refer to the manual) <input type="checkbox"/> Data showing use of designated items under the Green Procurement Law <input type="checkbox"/> Data showing use of Eco Mark products <input type="checkbox"/> Data showing use of blast furnace cement
[2] Use of recycled materials in non-structural applications	Levels 3 to 5 require the following pieces of documentation (refer to the manual for applicable items): <input type="checkbox"/> List of recycled materials in non-structural applications (refer to the manual) <input type="checkbox"/> Data showing use of designated items under the Green Procurement Law <input type="checkbox"/> Data showing use of Eco Mark products
<b>3.2.2 Control of waste disposal load</b>	<input type="checkbox"/> Data corresponding to marked initiatives** for Level 2 or higher (Stores only) Provide detailed descriptions of applicable initiatives (Stores only) 1) 2) 3) 4) 5) 6) 7) 8) 9) 10)

Figure I.15 Basis of Assessment Form (2 of 5)



[1] Implementation of biodiversity assessment and accreditation	Level 4 or 5 requires one the following pieces of documentation: <input type="checkbox"/> Data showing implementation of biodiversity assessment <input type="checkbox"/> Data showing accreditation of biodiversity assessment (e.g., copy of certificate)
[2] Assessment based on list of initiatives	Level 3 or higher requires one of the following pieces of documentation: <input type="checkbox"/> Data corresponding to marked initiatives Provide a detailed description of applicable initiatives: (Regarding [1], when no natural resources are deemed necessary to conserve, grounds thereof should be provided.) ①  ②  ③  ④  ⑤  Item 1) or 4) requires the following pieces of documentation: <input type="checkbox"/> 1) Aerial photo or residential map, etc., indicating land use prior to construction <input type="checkbox"/> 4) Greening plan drawing and green space calculation data
<b>4.2 Soil environmental quality/regeneration of brownfield sites</b>	Reason when not applicable:  <input type="checkbox"/> Level 4 or 5 requires the pieces of documentation showing the summary of initiatives
<b>4.3 Accessibility to public transport</b>	Level 3 or 5 is given when; Walking distance from a train station or a bus stop:            minutes <input type="checkbox"/> A map showing the way from a train station or a bus stop
<b>4.4 Countermeasures against natural disaster risks</b>	Level 2 or higher is given when; <input type="checkbox"/> List of countermeasures against natural disaster risks <input type="checkbox"/> Materials showing whether there are individual risks (A copy of a hazard map, etc.) <input type="checkbox"/> When any countermeasure is taken, materials providing its outline
<b>5. Indoor environment</b>	
	Basis of assessment/attached documents
[Prerequisite] Satisfy either [1] or [2] below	
[1] Compliance with the management standard of environmental sanitation for buildings	<input type="checkbox"/> General review on the air environment measurement (for 1 year)
[2] Assessment based on a questionnaire	<input type="checkbox"/> Questionnaire on hygiene control (filled-out) ※The actual questionnaire is on the next page.
[Items for additional points]	
<b>5.1 Use of daylight</b>	
[1] Effective aperture ratio for natural lighting	Level 3 or higher is given when: Aperture ratio: % <input type="checkbox"/> Materials showing the calculation process of effective aperture ratio of natural lighting (See the Manual.)
[2] Facilities using daylight	Level 4 or higher is given when: <input type="checkbox"/> Materials showing the summary of facilities using daylight
<b>5.2 Natural ventilation performance</b>	
	Level 3 or higher is given when: <input type="checkbox"/> Materials showing the calculation process of effective aperture ratio of natural ventilation (See the Manual.)
<b>5.3 View</b>	
	Level 3 or higher is given when: <input type="checkbox"/> Materials showing the ceiling height and conditions of windows (cross-sectional drawings, etc.)

Figure I.17 Basis of Assessment Form (4 of 5)

(Appendix)

**5. Indoor environment**

**【Prerequisite】** When conducting [2] Assessment based on a questionnaire, fill in the blanks and attach the form below.

## Questionnaire on hygiene control

Question	Answer (Please fill out.)
1-1. Is fresh air provided at more than 20 m <sup>3</sup> /hour for every occupant and circulated appropriately?	
1-2. Is air discharged as necessary for ventilation in the office?	
1-3. Are filters installed in air-conditioners?	
1-4. Is cleaning of filters in air-conditioners conducted regularly?	
2. Is the temperature kept between 17 and 28 deg C?	
3. Is the relative humidity kept between 40 to 70%?	
4. Is the airflow kept under 0.5m/s?	
5. Are interior materials and furniture selected in order to control formaldehyde generation?	
6. Is the ventilation in the car park conducted appropriately?	
7. Is there anyone appointed to be in charge of the hygiene control?	

Figure I.18 Basis of Assessment Form (5 of 5)

## PART II. Assessment standard

This assessment standard applies to existing offices and stores (more than 1 year after construction was completed).

Offices can be evaluated separately based on [the Office Edition] as before, and retail stores as well based on [the Retail Edition]. This manual is a combination of [the Office Edition] and [the Retail Edition].

In cases of a multi-purpose building consisting of offices and retail stores, assessments are carried out in terms of offices and retail stores, respectively, and a separate assessment result sheet is prepared for each of them. Finally, the total assessment score is calculated by dividing proportionally by the floor space (see Table below).

Applications other than offices and retail stores (a data center, condominiums, a large-scale car park, etc.) are included in the same building, and it would be desirable, if possible by means of measurements and the like, to exclude the impact of energy or water consumption thereof (excluding the floor space thereof at the same time). The certification is valid for 5 years; however, in cases when tenants of the store space change, which would make a great impact on the assessment result, a notification of change should be submitted.

Further, the assessment score is expressed to the first decimal place.

Table II.1 Calculation method for the total assessment score of a multi-purpose building consisting of offices and retail stores

Application	Assessment result of CASBEE for Market Promotion (Score)	Floor space (m <sup>2</sup> )
Office	xx.x	xxxxx.x
Store	xx.x	xxxx.x
Total	(Score obtained by dividing proportionally by the floor space of offices and stores)	(Total floor space)

\* In the case of a large-scale building, the floor space for the car park is excluded.

## 1. Energy/GHG emissions

**[Prerequisite]** All of the following [1] to [4] are satisfied.

### [1] Meeting energy conservation standards

- Confirm whether the energy conservation standards for houses and buildings specified under the Energy Conservation Law (the Evaluation Standards for Clients and Owners of Specified Buildings Concerning Rational Use of Energy) is met.
- It would be sufficient only if the standard at the time of construction was met. In cases where the calculation is based on old standards such as the PAL and CEC, provide calculated values based on the PAL and CEC, and indicate that the calculated values  $\leq$  the standard values. Alternatively, "calculated value  $\leq$  standard value" based on the point method can be indicated.
- In cases where the calculation is in accordance with the energy conservation standards revised in 2013, provide the standard values and assessment values, and indicate that the assessment values  $\leq$  the standard values.
- Buildings, in which the PAL- and CEC-values are not calculated, are considered as equivalent to satisfying the energy conservation standards, if the measured values of 1.2 meet Level 3 and above.

### [2] Setting energy consumption targets

- The measured value and the targeted value for the following fiscal year (MJ/m<sup>2</sup>/yr) are entered.  
*Example:* A 15% reduction over the previous year was targeted in 2013. Actual reduction achieved was 17%. A further reduction of 1% from 2013 is set as the target in 2014.

### [3] Implementation of monitoring

- The annual energy consumption for each purpose in the building is determined and a benchmark comparison is carried out using consumption output levels.

[Explanation]

Assessment is carried out on the implementation of measurements that lead to more efficient operation, through the continuous understanding of the energy consumption required during the actual operation phase of the building after construction has been completed.

### [4] Establishment of an operations management system

- The organization, system and policies for operations management are planned. Then the operation management system is organized and the manager is assigned.
- In cases where residents and tenants cooperate with the building owner to reduce operational energy consumption, an additional one point is given.

[Explanation]

This assessment focuses on the management system for systematic and organizational operation, maintenance and preservation, as well as the subsequent implementation of the target management plan.

In cases where residents and tenants cooperate with the building owner to reduce operational energy consumption, which is strongly desired these days, an additional one point is given.

**[Additional point(s)]** In addition to the required items, points are also given according to the following 1.1 to 1.3.

### 1.1 Energy intensity/Carbon intensity (calculated)

The assessment is based on a ratio (C/S) of the total annual consumption of the primary energy C of the target building for 5 items, namely air-conditioning, lighting, ventilation, hot water supply and elevators, to the annual primary energy consumption S of the target building, using the energy-saving plan that was developed at the time of construction. In cases where the energy saving plan is prepared based on the BEI (Design value/Standard value) in accordance with the energy conservation standards revised in 2013, the BEI shall be deemed equivalent to C/S.

In cases where the calculated value of the primary energy consumption is obtained based on the energy conservation standards revised in 2013, identify the calculated value and standard value as C and S, respectively, and calculate C/S (in other words, the BEI).

When the ERR value calculated as specified in the TMG Green Building Program is available, 1-ERR is regarded as being equivalent to C/S and can be used instead of C/S.

On-site natural energy, including photovoltaic power generation, may be subtracted from the annual primary energy consumption.

When evaluating commercial buildings, additional points are calculated in the same manner as offices by utilizing the primary energy consumption based on the energy conservation standards applicable to retail stores and restaurants. In a commercial building that accommodates both retail stores and restaurants, the calculation result shall be divided proportionally by the floor space.

#### Assessment standard Relationship between C/S value and additional points

C/S	>0.95	≤0.95	≤0.9	≤0.85	≤0.8	≤0.75	≤0.7	≤0.65	≤0.6	≤0.55	≤0.5
Points	15	16	17	18	19	20	21	22	23	24	25

#### Explanation

- Buildings for which PAL- and CEC-values are not calculated (those constructed before the Energy Conservation Law was enacted), or buildings for which the calculation results are missing, calculation using tools such as BEST as described below may be used instead.
- In cases where no calculation is possible based on the above, the assessment shall be deemed possible by utilizing the actual primary energy intensity and the statistical mean of the primary energy consumption (per floor space) by building scale listed in Table below. In such a case, the value obtained by dividing the measured primary energy consumption unit by the statistical average value by building scale is considered to be C/S, which is applied to the above table to conduct a level evaluation.
- Secondary energy consumption values and CO<sub>2</sub> emissions are shown in the assessment results sheet for reference.
- Secondary energy consumption is obtained by dividing the primary energy consumption by the primary energy conversion factor of the electricity.  
[Secondary energy consumption (kWh) = primary energy consumption (MJ) / 9.76 (MJ/kWh)]
- Energy consumption of individual energy sources including electricity and gas is converted into CO<sub>2</sub> emissions and are shown in the assessment results sheet for reference. In principle, conversion of the energy consumption into CO<sub>2</sub> emissions is carried out by referring to "1. Calculation method for operational CO<sub>2</sub> emissions" in Reference at the end of this manual.

Table II.2 Primary energy consumption per floor space (statistical average) [Office]

Building scale (Gross floor area)	Primary energy consumption per floor space (Statistical average)
Less than 10,000 m <sup>2</sup>	1,676MJ/m <sup>2</sup> /yr
10,000 m <sup>2</sup> or more and less than 30,000 m <sup>2</sup>	2,068MJ/m <sup>2</sup> /yr
30,000 m <sup>2</sup> or more	2,526MJ/m <sup>2</sup> /yr

Table II.3 Primary energy consumption per floor space (statistical average) [Retails]

Store type	Primary energy consumption per floor space (Statistical average)
(1) Retail stores	2,739 MJ/m <sup>2</sup> /yr
(2) Restaurants	19,826 MJ/m <sup>2</sup> /yr
(3) Department stores/Supermarkets (under 2,000 m <sup>2</sup> )	8,190 MJ/m <sup>2</sup> /yr
(3) Department stores/Supermarkets (2,000 m <sup>2</sup> and over and under 10,000 m <sup>2</sup> )	5,735 MJ/m <sup>2</sup> /yr
(3) Department stores/Supermarkets (10,000 m <sup>2</sup> and over)	3,450 MJ/m <sup>2</sup> /yr
(4) Home electronics mass retailers	3,140 MJ/m <sup>2</sup> /yr
(5) Convenience stores	14,180 MJ/m <sup>2</sup> /yr
(6) Office administration area in stores	Figures for offices apply.

- Calculation of C/S using the standard energy intensity, obtained by the Building-energy Appraisal Management System (BAMS) provided by the Building-Energy Manager's Association of Japan, is acceptable. In such a case, the value obtained by dividing the adjusted energy intensity by the standard energy intensity as displayed on the assessment results screen, is regarded as C/S and is applied to the above table, in order to carry out the level evaluation.

(Reference 1) WEB calculation program of primary energy consumption

In order to more simply identify the energy saving performance of the entire building, the energy conservation standards revised in 2013, which came into effect in April 2013, uses the primary energy consumption as a benchmark. A WEB computing program for primary energy consumption (for buildings) is provided by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) via the Building Research Institute to facilitate a quick calculation. While the program is designed to calculate primary energy consumption and standard values based on building plan details at the time of application of building certification, it is also considered applicable to existing buildings.

<http://www.kenken.go.jp/becc/#EnergyProgramForHouses>

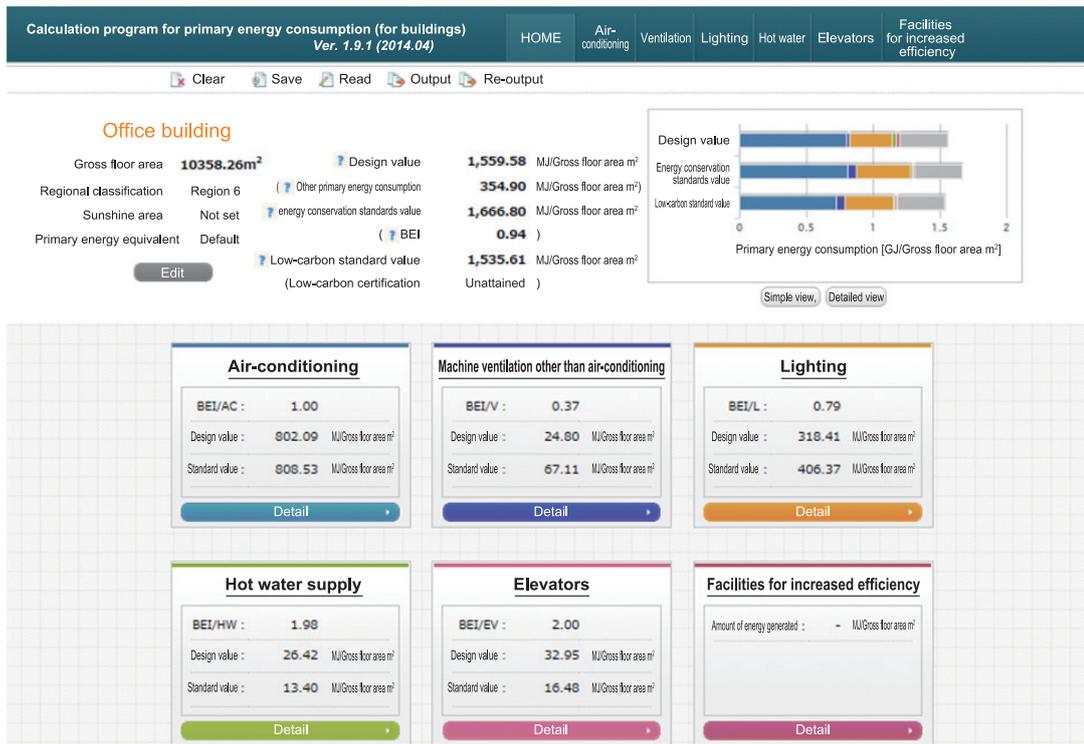


Figure II.1 Sample screen of WEB calculation program of primary energy consumption (for buildings)

(Reference 2) BEST (Building Energy Simulation Tool)

This simulation tool was developed by the Japan Sustainable Building Consortium (JSBC) in order to calculate the energy consumption of buildings. The tool consists of a simple version, professional version and energy conservation standards-support tool, according to the purpose of the user.

According to the notification concerning the 2013 energy conservation standards, a special method is allowed in the calculation for preparing an energy saving plan. "BEST 2013 energy conservation standards-support tool" is one of the approved calculation tools. Briefings regarding the BEST tool have been held in individual municipalities in order to inform the public thereof.

<http://www.ibec.or.jp/best/eco/index.html>

Main features of the BEST 2013 energy conservation standards-support tool are as follows:

- 1) The computing engine utilizes the BEST Program Professional Edition in which the coupled calculation is conducted between various elements such as construction and air-conditioning. Therefore, even when multiple energy saving methods that mutually affect each other, the combined effects would be accurately identified.
- 2) Constant maintenance and management allow examinations of energy saving effects of the latest energy-efficient systems, equipment and building materials.
- 3) A User Interface (UI) that reduces the number of data entry steps and errors is developed in order to allow anyone to conduct an energy saving calculation fairly easily.
- 4) Weather data in 842 locations across the country is available.
- 5) It could be utilized not only as an application tool but also as a tool for studying, evaluating and validating the energy efficiency.
- 6) It allows a comprehensive study on renewable energy including the solar power generation and use of solar heat that is absolutely necessary for the smart energy infrastructure, and technologies for reducing the peak load or peak power such as cogeneration and thermal storage.

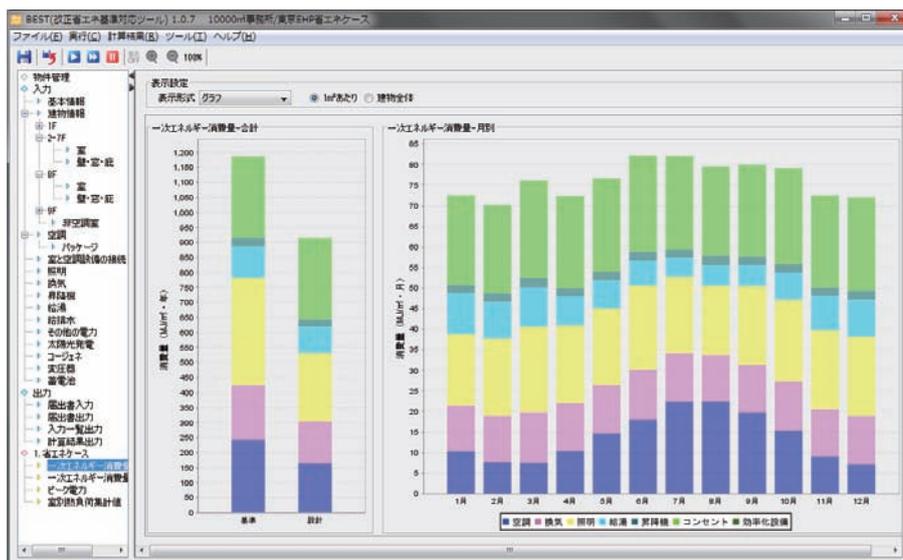


Figure II.2 Sample screen of the annual simulation by BEST

(Reference 3) BAMS (Building-energy Appraisalment Management System)

"Building-energy Appraisalment Management System (BAMS)" is a system for offices developed as "a measure of the energy-saving of buildings" by the Building-Energy Manager's Association of Japan in 2001.

BAMS determines the level of energy-saving performance, using the energy intensity (annual energy consumption / gross floor area) as the basis of assessment, and excludes factors attributed to the user, such as building scale, regional characteristics, conditions of use (occupancy and operating hours of the building) and the level of office automation (number of computers). It also considers factors attributed to the building itself such as building structure, specifications, facilities, the selection of energy sources and the operation and management of the building equipment. The results are expressed as primary energy consumption.

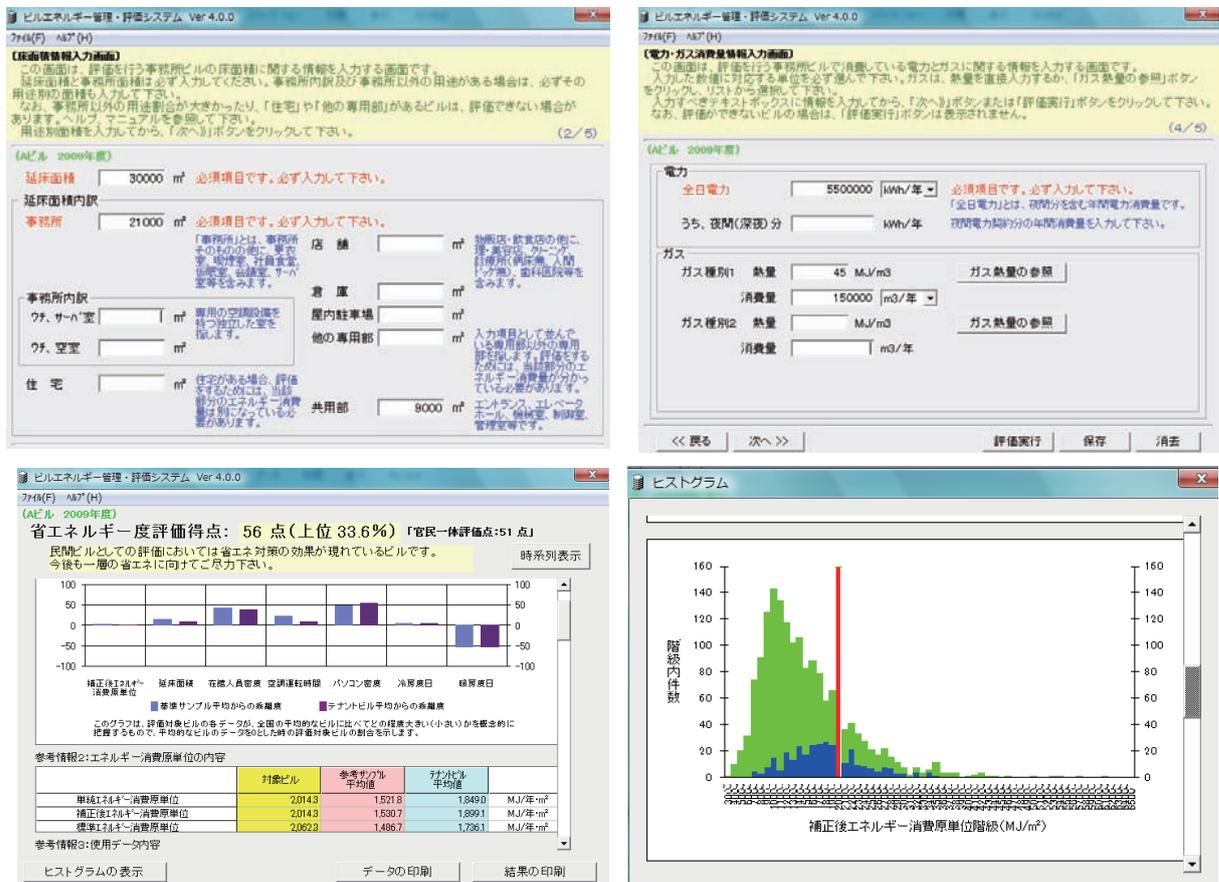


Figure II.3 Sample screens of Building-energy Appraisalment Management System (BAMS)

## 1.2 Energy intensity/Carbon intensity (measured)

[Office]

This assessment focuses on the actual situation of the measured energy consumption, including the daily operational conditions and improvements in the current operational method. The annual measured electric power consumption and gas consumption are converted into primary energy consumption, which is then divided by the gross floor area of the building, in order to obtain the primary energy intensity (MJ/m<sup>2</sup>/yr).

For conversion of electricity and gas consumption into primary energy consumption, please refer to "2. Primary energy corresponding value" in Reference at the end of this manual.

Assessment is carried out based on the standard shown below according to the calculated primary energy intensity, while referring to its position in the frequency distribution of the intensity by building scale (see Figure II.4-6), based on the statistical survey nationwide.

### □ Assessment standard

Level 1	High intensity range (between 0-10% from the bottom)
Level 2	High intensity range (between 10-25% from the bottom)
Level 3	Average intensity range (between 25-50%)
Level 4	Low intensity range (between 25-50% from the top)
Level 5	Low intensity range (between 0-25% from the top)

- The energy consumption for computer rooms, company cafeteria kitchen, special use of office rooms and commercial purposes, may be excluded from assessment, if calculated individually. In such case, the floor space for these areas should be excluded from the total floor space.
- Similar to the calculation process described in 1.1, the corresponding values in the secondary energy consumption (kWh/m<sup>2</sup>/yr) and CO<sub>2</sub> emissions are obtained and displayed for reference.

### □ Explanation

- In principle, the recently developed Data-base for Energy Consumption of Commercial building (DECC) is used as the standard value for assessment.
- Energy consumption in office buildings depends on various factors, including long operating hours, high operating rate and high load density for information equipment. This assessment focuses on energy usage efficiency according to the amount of activity, while considering the above factors as much as possible.
- The measured energy consumption data is organized into three categories; "Less than 10,000 m<sup>2</sup>," "10,000 m<sup>2</sup> or more and less than 30,000 m<sup>2</sup>," and "30,000 m<sup>2</sup> or more," according to the classification of gross floor area in the DECC.
- As shown in Figure III.5, large-scaled buildings generally include buildings with large energy consumption. Reasons for this may include the large carrier power required for multi-storied large surface area buildings, or large retailers or an information center within the premises which require large energy consumption. According to hearings conducted by persons in real estate, in many cases large-scaled buildings are likely to have along operating hours and advanced IT equipment.
- In view of the above, database for three categories is used for setting standard values based on classification by building scale.

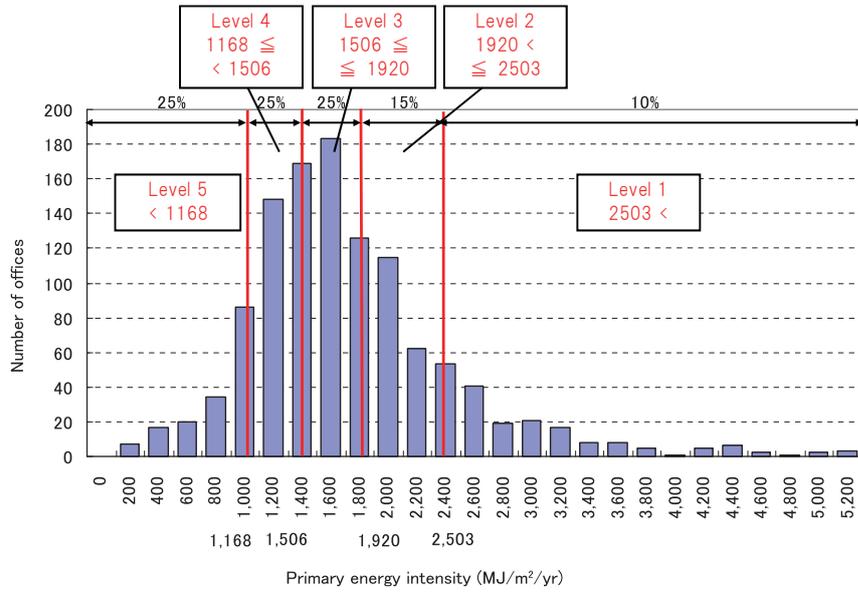


Figure II.4: Ranking by primary energy intensity less than 10,000 m<sup>2</sup>

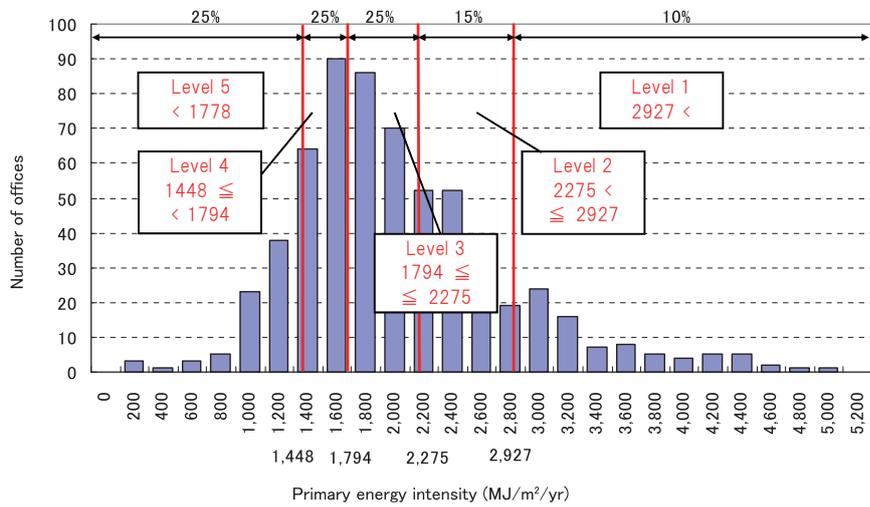


Figure II.5: Ranking by primary energy intensity 10,000 m<sup>2</sup> or more and less than 30,000 m<sup>2</sup>

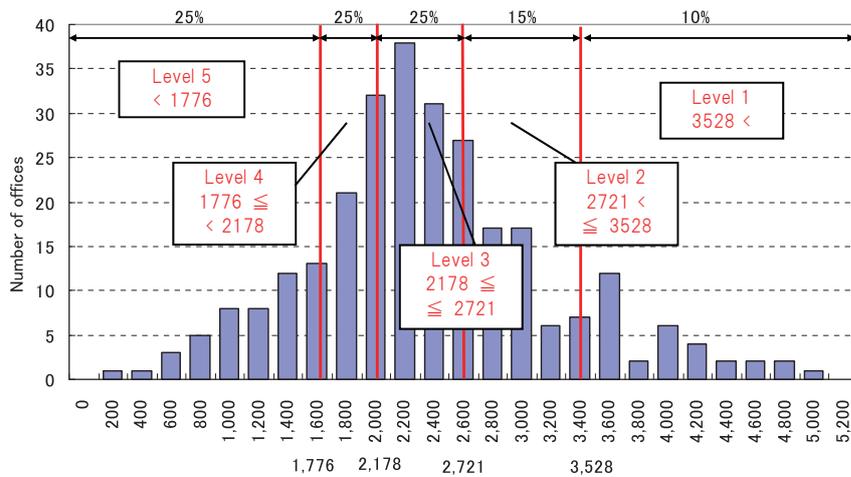


Figure II.6: Ranking by primary energy intensity 30,000 m<sup>2</sup> and over

## [Retails]

Regarding the assessment of actual consumption, in cases of a multi-purpose building that accommodates stores, restaurants and office administration areas, actual values are evaluated, in the end, in terms of the following purposes and are divided proportionally by the floor space. The assessment covers the gross floor area of the entire building excluding the car park, and is based on the intensity per unit area. In order to clarify business categories of the classified stores, actual store names are provided below. Note that the store names given are merely examples, which have absolutely no difference in terms of the performance from other stores whose names are not mentioned.

### ■ Concept of target buildings regarding actual energy consumption

#### (1) Retail stores:

A retail store consists of multiple tenant shops and common areas (communal corridors, entrance, outdoor space, core portions including WC/EV and other facilities, back-office functions area, etc.). Buildings subject to the assessment include the following. Shop windows are often used in the exterior of a building.

- Shop floors in a multi-purpose building (including in-shops of luxury brands)
- Buildings containing fashion-related stores (PARCO, LUMINE, VIVRE, SPIRAL, Tokyu Plaza, UNIQLO, etc.)
- Street-level shops of luxury brands (HERMES, PRADA, Louis Vuitton, etc.)

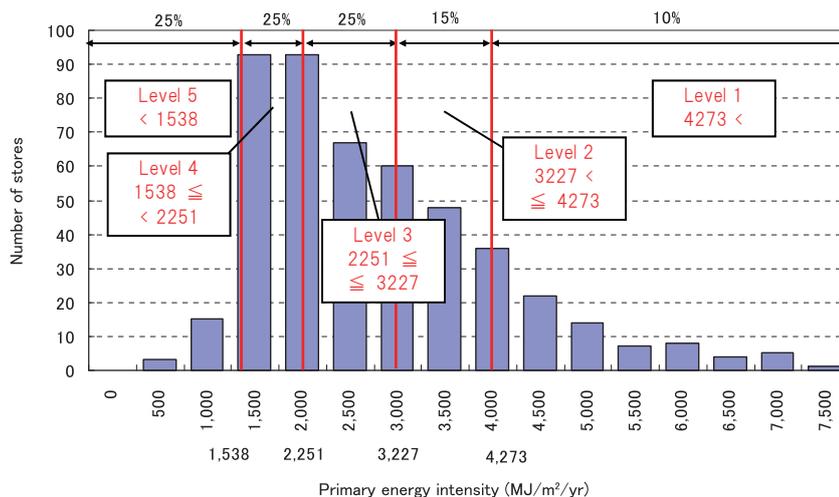


Figure II.7 Rank classification of primary energy consumption intensity (Retail stores)

#### (2) Restaurants:

A restaurant building consists of multiple tenant shops and common areas (communal corridors, entrances, outdoor space, core portions including WC/EV and other facilities, back-office functions areas, etc.). Buildings subject to the assessment include the following:

- Restaurant floors in a multi-purpose building (basement, top floor, etc.)
- Compound restaurant buildings
- Restaurant floors in a shop building, food courts, and restaurants in shop buildings
- Family restaurants, etc.

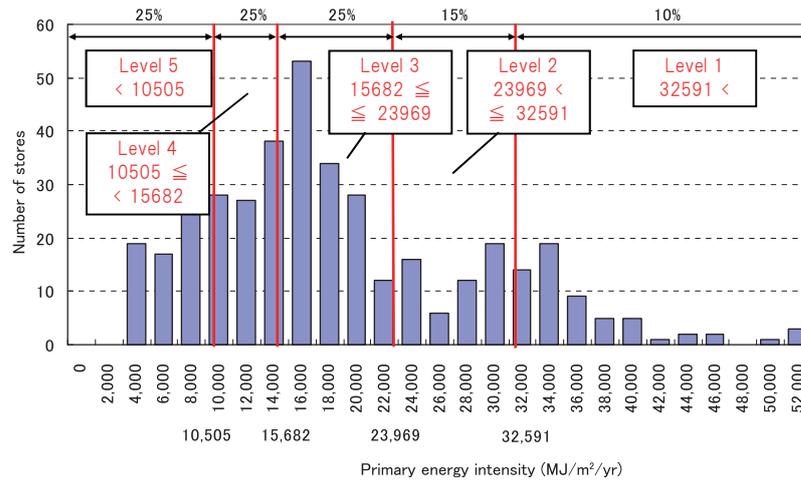


Figure II.8 Rank classification of primary energy consumption intensity (Restaurants)

(3) Department stores/Supermarkets (including food floors):

Department stores are usually located near stations in urban areas. Some of them are located as a large tenant in a suburban shopping mall. Buildings subject to the assessment include the following:

- Department stores (Mitsukoshi, Daimaru, Takashimaya, Sogo, Hankyu, PARCO, etc.)
- Supermarkets (Ito Yokado, AEON, Daiei, Kinokuniya, SEIJO ISHII, Daimaru Peacock, etc.)

As the energy consumption greatly varies in department stores/supermarkets depending on the store size, the assessment is carried out based on 3 size classifications (i.e., under 2,000 m<sup>2</sup>, between 2,000 and 10,000 m<sup>2</sup>, and over 10,000 m<sup>2</sup>)

	Under 2,000 m <sup>2</sup>	2,000 – 10,000 m <sup>2</sup>	Over 10,000 m <sup>2</sup>	Total
Average value	7,430	5,130	3,190	4,640
Number of data	214	860	710	1,784
25% score	6,250	3,800	2,510	3,060
50% score	7,510	4,990	3,140	4,120
75% score	8,870	6,480	3,760	6,140
90% score	10,450	7,410	4,450	7,610
Median value	7,510	4,990	3,140	4,120

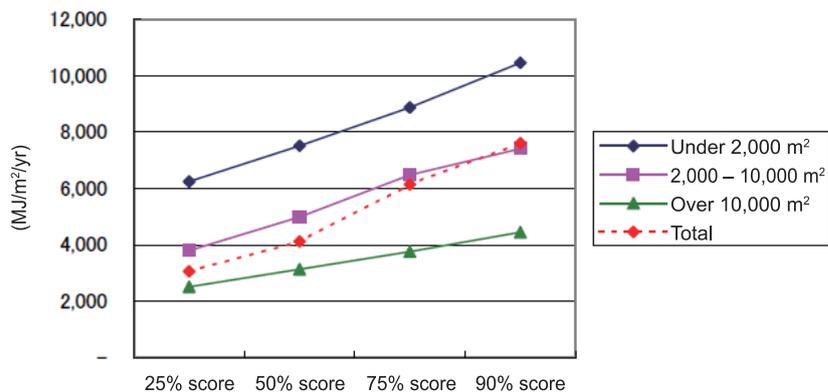


Figure II.9 Rank classification of primary energy consumption intensity (Department stores/Supermarkets)

- (4) Home electronics mass retailers: Buildings subject to the assessment include the following:  
 - Yamada Denki, Yodobashi Camera, etc.

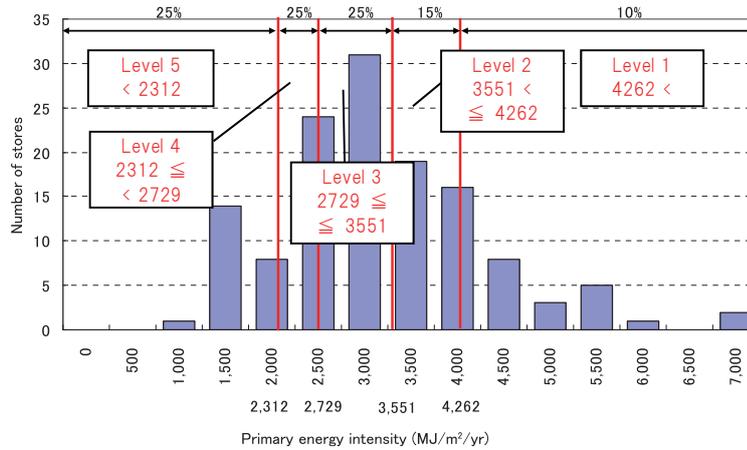


Figure II.10 Rank classification of primary energy consumption intensity (Home electronics mass retailers)

- (5) Convenience stores: Buildings subject to the assessment include the following:  
 - Seven Eleven, Lawson, FamilyMart, Circle K Sunkus, Ministop, etc.

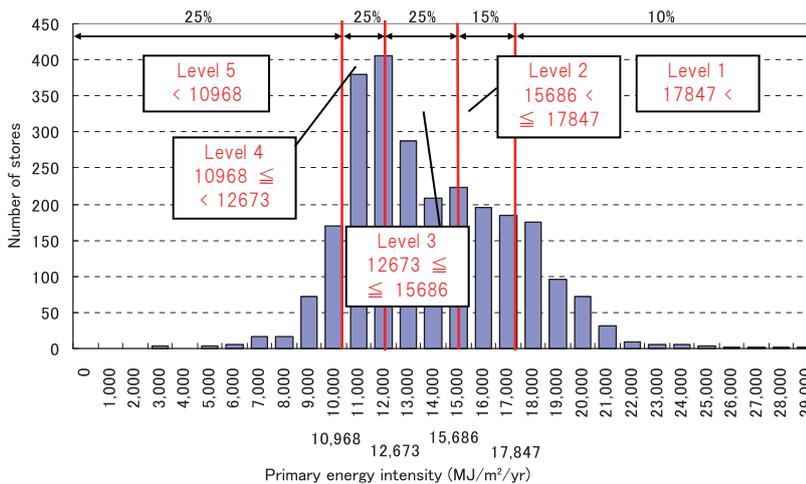


Figure II.11 Rank classification of primary energy consumption intensity (Convenience stores)

- (6) Office administration areas in stores: The assessment of office administration areas in stores is carried out in the same manner as evaluating the actual energy consumption of offices.

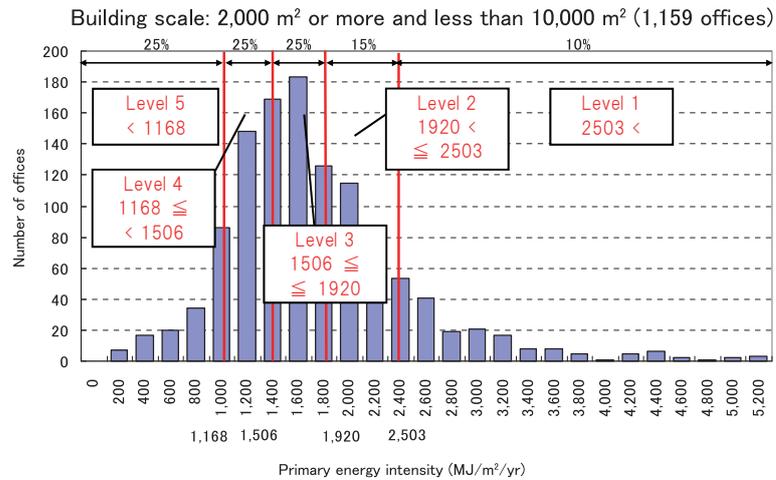


Figure II.12 Rank classification of primary energy consumption intensity  
(in cases where the office administration area in a store is from 2,000 to 10,000 m<sup>2</sup>)

- (7) Suburban-style shopping facilities:

The assessment of suburban-style shopping facilities is carried out by proportionally dividing retail stores, restaurants, department stores/supermarkets, office administration areas in the building and others by the floor space. Communal corridors are evaluated assuming their classification as retail stores. Buildings subject to the assessment of suburban-style shopping facilities include the following:

- Shopping malls (AEON Mall, Ito Yokado, Lalaport, Mozo Wondercity, etc.)
- Outlet malls (Outlet park, Premium Outlet, etc.)
- Large-scale specialty stores (IKEA, MaxValu, Cainz, Kohnan, Tokyu Hands, Aoyama Trading, etc.)

- (8) Assessment of actual energy consumption of the entire building:

In the assessment of actual energy consumption of the entire building, in cases where several stores classified as business categories from (1) to (7) above are located in the same building, assessment results of individual stores should be divided proportionally by their floor spaces, which would serve as the assessment result of the entire building.

In order to simplify the calculation, the assessment software includes a work sheet in which the proportional division is conducted. There are 2 types of work sheets to be selected depending on the energy measurement procedure. Figure II.13 on the next page shows one to be used when the energy consumption is measured by business category. Figure II.14 shows the other to be used when the energy consumption is measured in terms of the entire store portion.

The rater is allowed to select and use one from these 2 sheets at his/her discretion.

[1] In cases when actual figures in individual business categories are available in the assessment of energy and water

Enter in light-blue cells.  
Transcribe figures that appear in green cells to the assessment score column of the Store Assessment Result Sheet.

(1) Retail stores	(2) Restaurants	(3) Department stores/Supermarkets	(4) Home electronics mass retailers	(5) Convenience stores	(6) Office administration area of stores	(7) Others (deemed equivalent to retail stores)	Total
0.00	3.000	0.00	0.00	5.000	0.00	0.00	8.000
Composition ratio of the gross floor area							1.00

←Enter the floor space of each purpose

Weighting per area

\* In cases when C/S is obtained based on the BEI calculated according to the energy conservation standards revised in 2013, the entry of 1.1 (calculated value) below is unnecessary.

1.1 Use/Emission Intensity (Calculated value)	0						
1.2 Use/Emission Intensity (Actual value)	0						

←Enter the assessment result (15-25 points) by purpose  
←Enter the assessment result (1-5 points) by purpose

	Standard boundary value of primary energy consumption (by store category)				Target building
	25% score	50% score	75% score	90% score	
(1) Retail stores	1,538	2,251	3,227	4,273	
(2) Restaurants	10,505	15,682	23,969	32,591	
(3) Department stores/Supermarkets (by scale)	6,250	7,510	8,870	10,450	9,502
(4) Home electronics mass retailers	2,312	2,729	3,551	4,262	
(5) Convenience stores	10,968	12,673	15,686	17,847	
(6) Office administration area of stores	1,168	1,506	1,920	2,503	
(7) Others (deemed equivalent to retail stores)	1,538	2,251	3,227	4,273	

Unit: MJ/m<sup>2</sup>-yr

←Enter the actual primary energy consumption value (MJ/m<sup>2</sup>-yr) by purpose

Entry by business category

Entry by business category

2. Water

2.1 Water use (Calculated value)	0						
2.2 Water use (Actual value)	0						

←Enter the assessment result (1-5 points) by purpose  
←Enter the assessment result (1-5 points) by purpose

	Standard boundary value of potable water consumption (by store category)				評価建物
	25%点	50%点	75%点	90%点	
(1) Retail stores	404	1,102	1,731	3,089	
(2) Restaurants	14,205	21,053	30,404	36,641	
(3) Department stores/Supermarkets (by scale)	1,267	1,901	2,780	3,800	
(4) Home electronics mass retailers (deemed equivalent to retail stores)	404	1,102	1,731	3,089	
(5) Convenience stores	2,000	2,700	3,750	5,000	
(6) Office administration area of stores	490	693	975	1,293	
(7) Others (deemed equivalent to retail stores)	404	1,102	1,731	3,089	

Unit: L/m<sup>2</sup>-yr

←Enter the actual water consumption value (L/m<sup>2</sup>-yr) by purpose

Figure II.13 Work sheet in which the proportional assessment in store portions is conducted ([1] Retails score table)

[2] In cases where actual figures in individual business categories are unavailable in the assessment of energy and water (The measurement was conducted in terms of the entire building only.)

Enter in light-blue cells.  
Transcribe figures that appear in green cells to the assessment score column of the Store Assessment Result Sheet.

(1) Retail stores	(2) Restaurants	(3) Department stores/Supermarkets	(4) Home electronics mass retailers	(5) Convenience stores	(6) Office administration area of stores	(7) Others (deemed equivalent to retail stores)	Total
0.00	3.000	0.00	0.00	5.000	0.00	0.00	8.000
Composition ratio of the gross floor area							1.00

←Enter the floor space of each purpose

Weighting per area

\* In cases when C/S is obtained based on the BEI calculated according to the energy conservation standards revised in 2013, the entry of 1.1 (calculated value) below is unnecessary.

1.1 Use/Emission Intensity (Calculated value)	23.125	20		25			
1.2 Use/Emission Intensity (Actual value)							

←Enter the assessment result (15-25 points) by purpose  
\* Scores based on actual values are unnecessary in this sheet. Enter the assessment result in the assessment score column of the Store Assessment Result Sheet.

	Composition ratio	Standard boundary value of primary energy consumption (by store category)				Target building
		25% score	50% score	75% score	90% score	
(1) Retail stores	0.00	1,538	2,251	3,227	4,273	
(2) Restaurants	0.38	10,505	15,682	23,969	32,591	
(3) Department stores/Supermarkets (by scale)	0.00	6,250	7,510	8,870	10,450	
(4) Home electronics mass retailers	0.00	2,312	2,729	3,551	4,262	
(5) Convenience stores	0.63	10,968	12,673	15,686	17,847	
(6) Office administration area of stores	0.00	1,168	1,506	1,920	2,503	
(7) Others (deemed equivalent to retail stores)	0.00	1,538	2,251	3,227	4,273	
Target store (excluding car park)		10,794	13,801	18,792	23,376	22,500

Unit: MJ/m<sup>2</sup>-yr

←Enter the actual primary energy consumption value (MJ/m<sup>2</sup>-yr) of the entire store

2. Water

2.1 Water use (Calculated value)	0						
2.2 Water use (Actual value)							

←Enter the assessment result (1-5 points) by purpose  
\* Scores based on actual values are unnecessary in this sheet. Enter the assessment result in the assessment score column of the Store Assessment Result Sheet.

	Composition ratio	Standard boundary value of potable water consumption (by store category)				Target building
		25% score	50% score	75% score	90% score	
(1) Retail stores	0.00	404	1,102	1,731	3,089	
(2) Restaurants	0.38	14,205	21,053	30,404	36,641	
(3) Department stores/Supermarkets (by scale)	0.00	1,267	1,901	2,780	3,800	
(4) Home electronics mass retailers (deemed equivalent to retail stores)	0.00	404	1,102	1,731	3,089	
(5) Convenience stores	0.63	2,000	2,700	3,750	5,000	
(6) Office administration area of stores	0.00	490	693	975	1,293	
(7) Others (deemed equivalent to retail stores)	0.00	404	1,102	1,731	3,089	
Target store (excluding car park)		6,577	9,582	13,745	16,865	

Unit: L/m<sup>2</sup>-yr

←Enter the actual water consumption value (L/m<sup>2</sup>-yr) of the entire store

Figure II.14 Work sheet in which the proportional assessment in store portions is conducted ([2] Retails score table)

(Reference 4) DECC (Database for Energy Consumption of Commercial building) (Japan Sustainable Building Consortium (JSBC))

Regarding the energy consumption of non-residential buildings (the civilian sector), the 3-year survey data from 2007 to 2009 are available to the public. The survey data were later organized and recently updated, and have also been released as the 2013 edition. The survey classifies the whole nation into 8 regions, and is conducted based on cooperation among industry, government and academia centering upon hub universities.

[http://www.jsbc.or.jp/decc\\_download/outline.html](http://www.jsbc.or.jp/decc_download/outline.html)

### 1. Building features

(1) Building ID*1	Survey target area ID (Alphabet) + Building purpose ID (2 digits) + Serial number (6 digits) (See Table 1)
(2) Regional classification*1	Regional classification according to the Extended Degree Day method (See Figure 1 and Table 2)
(3) Building purpose	Specific purpose
(4) Type of ownership	Company-owned or lease
(5) Area classification (excluding the area for an indoor car park)	1. Less than 300 m <sup>2</sup> 2. 300 m <sup>2</sup> or over to less than 2,000 m <sup>2</sup> 3. 2,000 m <sup>2</sup> or over to less than 10,000 m <sup>2</sup> 4. 10,000 m <sup>2</sup> or over to less than 30,000 m <sup>2</sup> 5. 30,000 m <sup>2</sup> or over
(6) Era in which the construction was completed	Round down after the decimal point
(7) Number of stories	Divide into above ground and basement, Unit: Floor
(8) Opening hours	Divide into weekdays, Saturdays and Sundays, Unit: h/day
(9) Duration of air-conditioning	Cooling starting month, Cooling starting day, Cooling ending month, Cooling ending day, Heating starting month, Heating starting day, Heating ending month, Heating ending day
(10) Power contract	Unit: W/m <sup>2</sup> or VA/m <sup>2</sup>

### 2. Energy consumption

(1) Year in which data was collected		
(2) Power consumption	Unit: kWh/(m <sup>2</sup> -yr)	kWh/(m <sup>2</sup> -month) depending on the building
(3) Gas consumption	Type Unit: m <sup>3</sup> x 10-3/(m <sup>2</sup> -yr)	m <sup>3</sup> x 10-3/(m <sup>2</sup> -month) depending on the building
(4) LPG consumption	Unit: m <sup>3</sup> x 10-3/(m <sup>2</sup> -yr) or Unit g/(m <sup>2</sup> -yr)	m <sup>3</sup> x 10-3/(m <sup>2</sup> -month) depending on the building g/(m <sup>2</sup> -month) depending on the building
(5) Petroleum consumption	Type Unit: L/(m <sup>2</sup> -yr)	L/(m <sup>2</sup> -month) depending on the building
(6) Acceptance of district heating	Type Unit: MJ/(m <sup>2</sup> -yr)	MJ/(m <sup>2</sup> -month) depending on the building
(7) Primary energy conversion factor	<a href="#">See Table 3</a>	
(8) Annual primary energy consumption per unit gross floor area		

### 3. Water consumption

(1) Water consumption	Unit: m <sup>3</sup> /(m <sup>2</sup> -yr)	m <sup>3</sup> /(m <sup>2</sup> -month) depending on the building
-----------------------	--	---

Figure II.15 DECC Website

### 1.3 Natural energy

This assessment focuses on the power output (kW) ratio of natural energy (indirect application), including the photovoltaic, wind and biomass power generation, to the maximum instantaneous consumption of electricity (kW), and as with CASBEE for New Construction (2010 edition), targets on-site natural energy utilization. Assessment on the off-site natural energy utilization is currently in a transitional period, and will be considered in view of future developments.

In cases where natural energy is converted into electric energy, assessment is carried out based on the following assessment standard using the ratio of electric power supply by the natural energy to the electric load of the entire building during peak hours.

#### □ Assessment standard

Assessment standard when used as electric energy

Level 1	(Not applicable)
Level 2	(Not applicable)
Level 3	(Ratio of Power supply by natural energy to Maximum instantaneous consumption of electricity) < 1%
Level 4	(Ratio of Power supply by natural energy to Maximum instantaneous consumption of electricity) $\geq$ 1%
Level 5	(Ratio of Power supply by natural energy to Maximum instantaneous consumption of electricity) $\geq$ 5%

When using solar heat, well water, river water, geothermal heat and sewage water as thermal energy, it is difficult to carry out assessment based solely on the electricity ratio during peak hours. As such, the annual natural energy application (the primary energy equivalent) may be evaluated based on its ratio to the annual energy consumption of the entire building (the primary energy equivalent).

Assessment standard when used as thermal energy

Level 1	(Not applicable)
Level 2	(Not applicable)
Level 3	(Ratio of Natural energy usage to Annual energy consumption of the entire building) < 1%
Level 4	(Ratio of Natural energy usage to Annual energy consumption of the entire building) $\geq$ 1%
Level 5	(Ratio of Natural energy usage to Annual energy consumption of the entire building) $\geq$ 5%

## 2. Water use

**[Prerequisite]** The following Items (1) and (2) are both satisfied.

(1) Target setting in water consumption

- The measured water consumption and a target value for the next year (L/m<sup>2</sup>/yr) are established.

(2) Monitoring

- The annual water consumption of the building is determined and a benchmark comparison may be carried out based on the water intensity.

### **[Additional point(s)]**

In addition to the required items, points are given according to the following 2.1 to 2.2.

### **2.1 Water consumption (calculated)**

[Office]

The annual consumption of potable water of the entire building in the standard use conditions is obtained in the calculation sheet of the assessment software (Figure II.16). Upon entering the necessary data in the required fields (capacity, gross floor area, male-to-female ratio, water discharge quantity of sanitary fixtures, business category and floor space of a restaurant, etc.), the annual water consumption of the entire building in the standard use conditions is calculated. Reuse of rain water and gray water can be reflected in the potable water usage and the general service water consumption by entering the reuse rate. The cooling tower water for air-conditioning and the potable water or general service water used for sprinklers for plant-watering are excluded from the calculation.

The annual potable water intensity per floor space is obtained based on the calculated value, and evaluated according to the assessment standard provided below.

#### **□Assessment standard**

Level 1	High intensity range (between 0-10% from the bottom)
Level 2	High intensity range (between 10-25% from the bottom)
Level 3	Average intensity range (between 25-50% from the bottom)
Level 4	Low intensity range (between 25-50% from the top)
Level 5	Low intensity range (between 0-25% from the top)

#### **□Explanation**

This assessment is carried out in consideration of the frequency distribution of the annual potable water consumption per floor space in office buildings nationwide (Figure II.18). According to the frequency distribution, the statistics for the potable water usage provided by the DECC are classified into five grades- bottom 10%, low-mid 15%, average 25%, upper-mid 25% and top 25%, and are defined as Level 1 to 5, respectively, in the assessment.

When the amount of water discharge from sanitation fixtures cannot be determined, the values from Table II.4 are used. If there are fixtures which were installed at different times, the amount of water discharge is allotted in proportion to the number of fixtures.

Table II.4 Reference data for the amount of water discharge from sanitation fixtures

Purpose of fixture	Men's toilet	Men's urinal	Men's wash basin	Women's toilet	Women's wash basin	Pantry	Cleaning	Total
Use frequency [times/day-person]	0.42	2.88	3.3	2.93	3.3			
Amount of water discharge from fixtures	[L/time]					[L/day-person]	[L/day-person]	[L/day-person]
1 Buildings constructed in the 1970s	20.0	6.0	3.0	20.0	3.0	1.6	4.7	85.4
2 Buildings constructed in the 1980s	13.0	5.0	3.0	13.0	3.0	1.6	3.3	65.0
3 Buildings constructed in the 1990s	10.0	4.5	2.5	10.0	2.5	1.6	2.7	52.7
4 Standard buildings	8.0	4.0	2.0	8.0	2.0	1.6	2.2	43.1
5 Water-saving buildings	6.0	2.0	1.0	6.0	1.0	1.6	1.4	27.7
6 Super water-saving buildings	4.8	1.5	0.5	4.8	0.5	1.6	1.1	20.2

Source: Iwao Hasegawa et al., "Development of an Integrated Energy Simulation Tool for Buildings and MEP Systems, the BEST (Part 87) A Study on the residence time of feed-water using a water supply program", the Academic Lecture Papers 2011, the Society of Heating, Air-Conditioning and Sanitation Engineers of Japan.

Calculation of water consumption in office buildings

\* The cooling tower water for air-conditioning is excluded from the calculation. Note:

  : Required data      Enter values in cells with red borders.  
  : Defined value according to documents      Pre-populated values are for example only. Delete all values first before entering actual data.  
  : Calculated value

- 1) Capacity 2200 People
- 2) Gross floor area 30000 m<sup>2</sup>
- 3) Male-to-female ratio    Men 70 %      Women 30 %  
                                   Men 1540 People    Women 660 People

4) Calculation of water consumption

[1] Toilets, wash basins and hot water supply

	Amount of water discharge from sanitation fixtures	Frequency of use of fixtures*1	Number of users			
Men's toilets (General service water)	<span style="border: 1px solid red; padding: 2px;">8.0</span> L/time ×	<span style="border: 1px solid green; padding: 2px;">0.42</span> times/day ×	<span style="border: 1px solid blue; padding: 2px;">1540</span> persons =	<span style="border: 1px solid blue; padding: 2px;">5,174</span> L/day		General service water 1,552,320
Men's urinals (General service water)	<span style="border: 1px solid red; padding: 2px;">4.0</span> L/time ×	<span style="border: 1px solid green; padding: 2px;">2.88</span> times/day ×	<span style="border: 1px solid blue; padding: 2px;">1540</span> persons =	<span style="border: 1px solid blue; padding: 2px;">17,741</span> L/day		General service water 5,322,240
Men's wash basins (Potable water)	<span style="border: 1px solid red; padding: 2px;">2.0</span> L/time ×	<span style="border: 1px solid green; padding: 2px;">3.3</span> times/day ×	<span style="border: 1px solid blue; padding: 2px;">1540</span> persons =	<span style="border: 1px solid blue; padding: 2px;">10,164</span> L/day		Potable water 3,049,200
Women's toilets (General service water)	<span style="border: 1px solid red; padding: 2px;">8.0</span> L/time ×	<span style="border: 1px solid green; padding: 2px;">2.93</span> times/day ×	<span style="border: 1px solid blue; padding: 2px;">660</span> persons =	<span style="border: 1px solid blue; padding: 2px;">15,470</span> L/day		General service water 4,641,120
Women's wash basins (Potable water)	<span style="border: 1px solid red; padding: 2px;">2.0</span> L/time ×	<span style="border: 1px solid green; padding: 2px;">3.3</span> times/day ×	<span style="border: 1px solid blue; padding: 2px;">660</span> persons =	<span style="border: 1px solid blue; padding: 2px;">4,356</span> L/day		Potable water 1,306,800
Hot water supply*4 (Potable water)	<span style="border: 1px solid red; padding: 2px;">2.5</span> L/time ×	<span style="border: 1px solid green; padding: 2px;">3</span> times/day ×	<span style="border: 1px solid blue; padding: 2px;">2200</span> persons =	<span style="border: 1px solid blue; padding: 2px;">16,500</span> L/day (for drinking, dishwashing, etc.)		Potable water 4,950,000
				Number of operating days		
				Subtotal 69,406 L/day ×		<span style="border: 1px solid green; padding: 2px;">300</span> days/yr =
				( 32 L/person/day)		<span style="border: 1px solid green; padding: 2px;">20,821,680</span> L/yr      Subtotal 20,821,680

[2] Cleaning of fixtures	Gross floor area	Intensity of the number of sanitation fixtures*2	Number of fixtures
Toilets	30000m <sup>2</sup> ×	<span style="border: 1px solid green; padding: 2px;">0.0047</span> fixtures/m <sup>2</sup> =	<span style="border: 1px solid blue; padding: 2px;">141</span> fixtures
Urinals	30000m <sup>2</sup> ×	<span style="border: 1px solid green; padding: 2px;">0.0025</span> fixtures/m <sup>2</sup> =	<span style="border: 1px solid blue; padding: 2px;">75</span> fixtures
Wash basins	30000m <sup>2</sup> ×	<span style="border: 1px solid green; padding: 2px;">0.0047</span> fixtures/m <sup>2</sup> =	<span style="border: 1px solid blue; padding: 2px;">141</span> fixtures

	Number of fixtures	Amount of water discharge from sanitation fixtures	Use frequency			
Toilets (General service water)	141 fixtures ×	8.0 L/time ×	<span style="border: 1px solid green; padding: 2px;">3</span> times/day =	<span style="border: 1px solid blue; padding: 2px;">3384</span> L/day		General service water 812,160
Urinals (General service water)	75 fixtures ×	4.0 L/time ×	<span style="border: 1px solid green; padding: 2px;">3</span> times/day =	<span style="border: 1px solid blue; padding: 2px;">900</span> L/day		General service water 216,000
Wash basins (Potable water)	141 fixtures ×	2.0 L/time ×	<span style="border: 1px solid green; padding: 2px;">3</span> times/day =	<span style="border: 1px solid blue; padding: 2px;">846</span> L/day		Potable water 203,040
				Subtotal 5,130 L/day ×		Number of operating days
				( 240 days/yr =		<span style="border: 1px solid green; padding: 2px;">1,231,200</span> L/yr      Subtotal 1,231,200

[3] Cafeteria (Potable water)	Water consumption per meal*3	Number of meals		Number of operating days	
	<span style="border: 1px solid green; padding: 2px;">35</span> L/meal·day ×	<span style="border: 1px solid red; padding: 2px;">800</span> meals =	<span style="border: 1px solid blue; padding: 2px;">28,000</span> L/day ×	<span style="border: 1px solid green; padding: 2px;">240</span> days/yr =	<span style="border: 1px solid green; padding: 2px;">6,720,000</span> L/yr      Potable water 6,720,000

5) Collective water consumption

	<span style="border: 1px solid blue; padding: 2px;">16,229,040</span> L/yr	(1)
	<span style="border: 1px solid blue; padding: 2px;">12,543,840</span> L/yr	(2)
<b>Total</b>	<span style="border: 1px solid blue; padding: 2px;">28,772,880</span> L/yr	(3) = (1) + (2)
	( <span style="border: 1px solid blue; padding: 2px;">959</span> L/m <sup>2</sup> -yr)	

6) Reduction in the potable water usage by the reuse of rain water and gray water

Rate of substitution for potable water or reuse rate by the reuse of rain water and gray water 20 %  
 (Ratio to the total water consumption)

Amount of reused water 5,754,576 L/yr      (4) = (3) × %  
 Upper limit check 5,754,576 L/yr      (5): (4) must be less than (2)

Potable water	<span style="border: 1px solid blue; padding: 2px;">16,229,040</span> L/yr	(1)
General service water (supplement to potable water)	<span style="border: 1px solid blue; padding: 2px;">6,789,264</span> L/yr	(6): (2) - (5)
<b>Total</b>	<span style="border: 1px solid red; padding: 2px;">23,018,304</span> L/yr	
	( <span style="border: 1px solid red; padding: 2px;">767</span> L/m <sup>2</sup> -yr)	

Figure II.16 Calculation software for water consumption in office buildings

**[Retails]**

The annual consumption of potable water of the entire building in the standard use conditions is obtained in the calculation sheet of the assessment software (Figure II.17). Upon entering the necessary data in the required fields (capacity, gross floor area, male-to-female ratio, water discharge quantity of sanitary fixtures, business category and floor space of a restaurant, etc.), the annual water consumption of the entire building in the standard use conditions is calculated. Reuse of rain water and gray water can be reflected in the potable water usage and the general service water consumption by entering the reuse rate. The cooling tower water for air-conditioning and the potable water or general service water used for sprinklers for plant-watering are excluded from the calculation.

The annual potable water intensity per floor space is obtained based on the calculated value, and evaluated according to the assessment standard provided below.

**□Explanation**

The benchmark of potable water consumption is calculated based on the proportional division in terms of the floor spaces of individual tenants accommodated in the building, such as retail stores, restaurants and department stores/supermarkets, in order to evaluate the ranking in the potable water consumption intensity obtained by the special calculation software. According to the frequency distribution, the statistics for the potable water usage provided by the DECC are classified into five grades- bottom 10%, low-mid 15%, average 25%, upper-mid 25% and top 25%, and are defined as Level 1 to 5, respectively, in the assessment.

The water consumption of toilets is calculated based on the number of permanent employees and visitors of the entire building. When the water discharge quantity of the sanitary fixtures of the entire building is unavailable, enter the corresponding value in reference to Table II.4. If there are fixtures which were installed at different times, the amount of water discharge is allotted in proportion to the number of fixtures.

Calculation of water consumption of store buildings

\* The cooling tower water for air-conditioning is excluded from the calculation.

Note:

- : Required data
- : Defined value according to documents
- : Calculated value

Enter values in cells with red borders.

Pre-populated values are for example only. Delete all values first before entering actual data.

1) Permanent employees	100	People
Visitors	2000	People
2) Gross floor area	30000	m <sup>2</sup>
3) Number of working days	320	Day
4) Male-to-female ratio	Men <span style="border: 1px solid red;">70</span> %	Women <span style="border: 1px solid blue;">30</span> %
(Permanent employees)	Men <span style="border: 1px solid red;">70</span> %	Women <span style="border: 1px solid blue;">30</span> People
Male-to-female ratio	Men <span style="border: 1px solid red;">70</span> %	Women <span style="border: 1px solid blue;">30</span> %
(Visitors)	Men <span style="border: 1px solid red;">1400</span> %	Women <span style="border: 1px solid blue;">60</span> People

5) Calculation of water consumption

[1] Toilets/wash basins/hot water supply used by permanent employees

	Amount of water discharge from sanitation fixtures	Frequency of use of fixtures*1	Duration of stay	Number of users	
Men's toilets (General service water)	8.0 L/time	0.047 times/h	12 h	70 persons =	316 L/day
Men's urinals (General service water)	4.0 L/time	0.32 times/h	12 h	70 persons =	1,075 L/day
Men's wash basins (Potable water)	2.0 L/time	0.367 times/h	12 h	70 persons =	617 L/day
Women's toilets (General service water)	8.0 L/time	0.326 times/h	12 h	30 persons =	939 L/day
Women's wash basins (Potable water)	2.0 L/time	0.326 times/h	12 h	30 persons =	235 L/day
Hot water supply*4 (Potable water)	2.0 L/time	3 times/day		100 persons =	750 L/day (for drinking, dishwashing, etc.)
				Number of operating days	
				Subtotal	3,931 L/day × <span style="border: 1px solid blue;">320 days/yr =</span> <span style="border: 1px solid blue;">1,257,984 L/yr</span>
				(	39 L/person-day) (
					42 L/m <sup>2</sup> -yr)

\* Use frequency for wash basins: Men's toilets + urinals  
Same for women's toilets

[2] Toilets/wash basins used by visitors

	Amount of water discharge from sanitation fixtures	Frequency of use of fixtures*1	Duration of stay	Number of users	
Men's toilets (General service water)	8.0 L/time	0.047 times/h	2 h	1400 persons =	1,053 L/day
Men's urinals (General service water)	4.0 L/time	0.32 times/h	2 h	1400 persons =	3,584 L/day
Men's wash basins (Potable water)	2.0 L/time	0.367 times/h	2 h	1400 persons =	2,055 L/day
Women's toilets (General service water)	8.0 L/time	0.326 times/h	2 h	600 persons =	3,130 L/day
Women's wash basins (Potable water)	2.0 L/time	0.326 times/h	2 h	600 persons =	782 L/day
				Number of operating days	
				Subtotal	10,604 L/day × <span style="border: 1px solid blue;">320 days/yr =</span> <span style="border: 1px solid blue;">3,393,280 L/yr</span>
				(	106 L/person-day) (
					113 L/m <sup>2</sup> -yr)

\* Use frequency for wash basins: Men's toilets + urinals  
Same for women's toilets

[3] Cleaning of fixtures

	Gross floor area	Intensity of the number of sanitation fixtures*2	Number of fixtures	
Toilets (General service water)	30000 m <sup>2</sup> ×	0.0023 fixtures/m <sup>2</sup>	69 fixtures	
Urinals (General service water)	30000 m <sup>2</sup> ×	0.0011 fixtures/m <sup>2</sup>	33 fixtures	
Wash basins (Potable water)	30000 m <sup>2</sup> ×	0.0024 fixtures/m <sup>2</sup>	72 fixtures	
				Number of fixtures
Toilets (General service water)	69 fixtures ×	8.0 L/time	3 times/day	1656 L/day
Urinals (General service water)	33 fixtures ×	4.0 L/time	3 times/day	396 L/day
Wash basins (Potable water)	72 fixtures ×	2.0 L/time	3 times/day	432 L/day
				Subtotal
				2,484 L/day × <span style="border: 1px solid blue;">320 days/yr =</span> <span style="border: 1px solid blue;">794,880 L/yr</span>

[4] Restaurants

	Water consumption per customer*3	Number of customers*		Operating days
Café/light meal	15 L/person-day	100 persons =	1500 L/day	320 days/yr = <span style="border: 1px solid blue;">480,000 L/yr</span>
Chinese/noodles/barbecue	30 L/person-day	100 persons =	3000 L/day	320 days/yr = <span style="border: 1px solid blue;">960,000 L/yr</span>
Japanese food	70 L/person-day	100 persons =	7000 L/day	320 days/yr = <span style="border: 1px solid blue;">2,240,000 L/yr</span>
Western food	50 L/person-day	100 persons =	5000 L/day	320 days/yr = <span style="border: 1px solid blue;">1,600,000 L/yr</span>
			Subtotal	400 persons =

\* When the number of customers is unavailable, the projected value of Number of customer seats  
× Turnover number may be entered instead.

6) Collective water consumption

Potable water	6,838,682 L/yr	(1)
General service water	3,887,462 L/yr	(2)
Total (Entire building)	10,726,144 L/yr	(3) = (1) + (2)
	(	358 L/m <sup>2</sup> -yr)

7) Reduction in the potable water usage by the reuse of rain water and gray water

Rate of substitution for potable water or reuse rate by the reuse of rain water and gray water 20 %  
(Ratio to the total water consumption)

Amount of reused water 2,145,229 L/yr (4) = (3) × %  
Upper limit check 2,145,229 L/yr (5): (4) must be less than (2)

Potable water	6,838,682 L/yr	(1)
General service water (supplement to potable water)	1,742,234 L/yr	(6) = (2) - (5)
Total (Potable water)	8,580,915 L/yr	
	(	286 L/m <sup>2</sup> -yr)

Source)

- 1) Committee on Sanitary fixtures for Water Supply and Drainage for Buildings/Sub-Committee on Design Data Review, the Society of Heating, Air-Conditioning and Sanitary Engineers of Japan, "Method for calculating water consumption based on water use activities (Proposal on a new design for water supply intensity)", Symposium materials, p.48, Table 3.3.2 "Workplace" (Times/h)
- 2) Ditto, p.60, Table 3.4.26, Refer to the figures provided in "Department stores"
- 3) Ditto, p.25, Table 2.2.9-9 to 14, Adopt the mean value of individual catering purposes
- 4) Fumitoshi Kiya, "Hygienics of water supply/drainage fixtures", Intermediate level, Water section practice, TOTO, p.60, Table 3, Remarks column "Hot water supply"

Figure II.17 Software for calculating water consumption in store buildings

### 2.2 Water consumption (measured)

According to the measured potable water usage, the assessment is carried out based on the annual potable water intensity per floor space.

As with the calculated water consumption, the potable water consumption should be obtained after reflecting the potable water-saving effect of the reuse of rain water and gray water. The cooling tower water for air-conditioning, the potable water or general service water used for sprinklers for plant-watering and for commercial purposes are excluded from the calculation. In such case, ensure that the area for commercial purposes is excluded from the gross floor area.

The consumption of the regional reclaimed water and industrial water may be excluded from the potable water usage.

#### □Assessment standard

Level 1	High intensity range (between 0-10% from the bottom)
Level 2	High intensity range (between 10-25% from the bottom)
Level 3	Average intensity range (between 25-50% from the bottom)
Level 4	Low intensity range (between 25-50% from the top)
Level 5	Low intensity range (between 0-25% from the top)

#### □Explanation

[Office]

This assessment is carried out in consideration of the frequency distribution of the annual potable water usage per floor space in office buildings nationwide (Figure II.18). According to the frequency distribution, the statistics for potable water usage provided by the DECC are classified into five grades as bottom 10%, low-mid 15%, average 25%, upper-mid 25% and top 25%, and are defined as Levels 1 to 5, respectively, in the assessment.

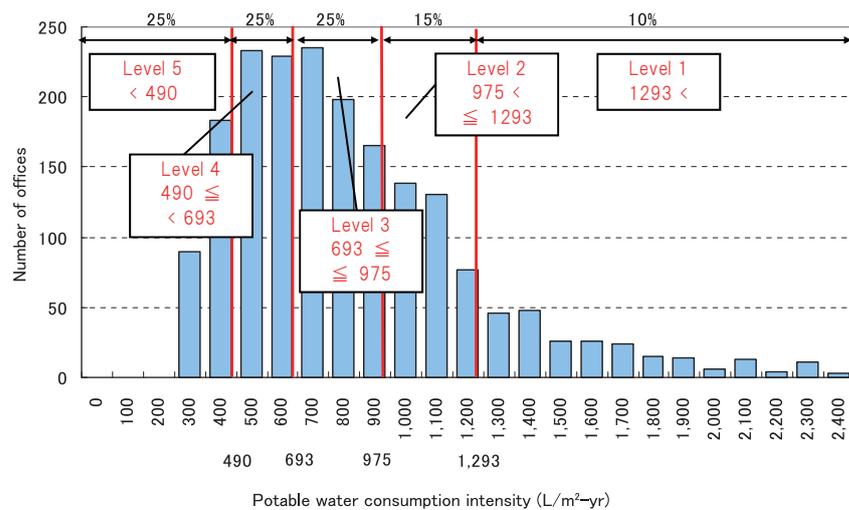


Figure II.18 Rank classification of water consumption intensity (Frequency distribution for office purposes nationwide by DECC)

[Retailers]

The assessment of actual potable water consumption (excluding the amount of reused waste water and rainwater consumed) is in reference to the following DECC statistical data.

In multi-purpose buildings, the assessment is carried out based on actual values in terms of the following purposes, respectively, and by finally dividing proportionally by the floor space.

The floor space, excluding the car park portion from the gross floor area, is subject to the assessment, which is evaluated in terms of the intensity per unit floor space.

The amount of potable water used in the kitchen varies depending on the types of restaurants. At the moment, no analysis classified based on the DECC actual values has been conducted. However, since the consumption in the kitchen is affected significantly, it is included in the assessment.

(1) Retail stores

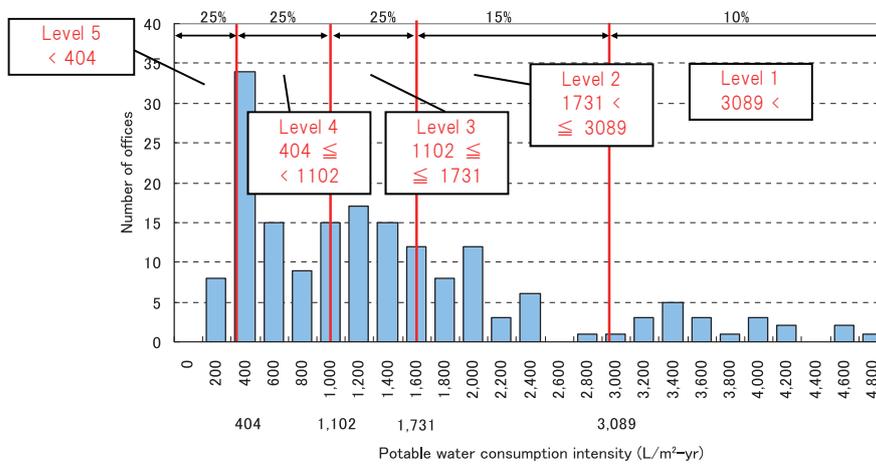


Figure II.19 Rank classification of water consumption intensity (Retail stores)

(2) Restaurants

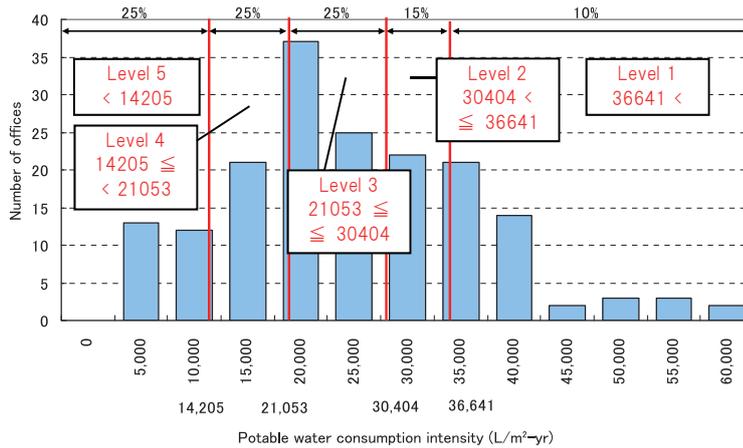


Figure II.20 Rank classification of water consumption intensity (Restaurants)

(3) Department stores/Supermarkets

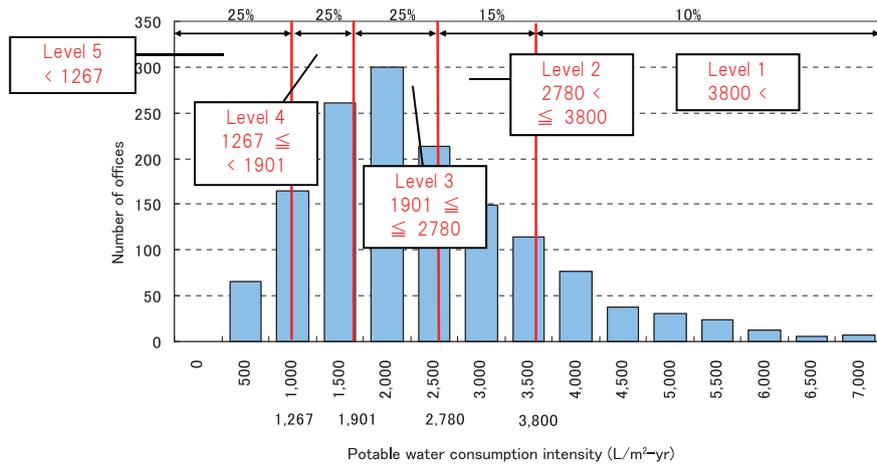


Figure II.21 Rank classification of water consumption intensity (Department stores/Supermarkets)

(4) Home electronics mass retailers

The assessment of retail stores applies since the amount of water consumed is small.

(5) Convenience stores

There are very few statistical samples. As for retail stores, the distribution of 24-hour stores (distribution of large consumption establishments) is similar but there are also hardly any samples. In light of these two factors, the assessment is based on the table below for the time being. As convenience stores usually include kitchen facilities, refrigerating showcases and wet-cleaning of kitchen floors, the water consumption tends to be higher than that of retail stores.

Level 1	The potable water consumption intensity is 5,000 L/m <sup>2</sup> -yr or over
Level 2	The potable water consumption intensity is 3,750 L/m <sup>2</sup> -yr or over and less than 5,000 L/m <sup>2</sup>
Level 3	The potable water consumption intensity is 2,700 L/m <sup>2</sup> -yr or over and less than 3,750 L/m <sup>2</sup>
Level 4	The potable water consumption intensity is 2,000 L/m <sup>2</sup> -yr or over and less than 2,700 L/m <sup>2</sup>
Level 5	The potable water consumption intensity is less than 2,000 L/m <sup>2</sup>

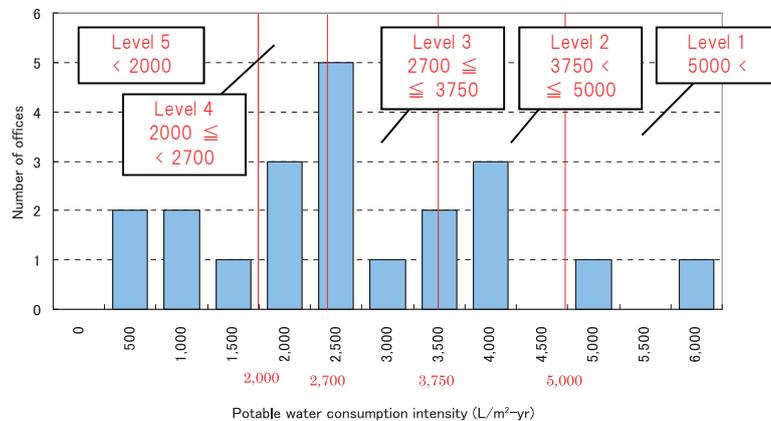


Figure II. 22 Frequency distribution of water consumption intensity (Convenience stores)

## (6) Office administration area in store

The assessment of actual energy consumption in offices applies.

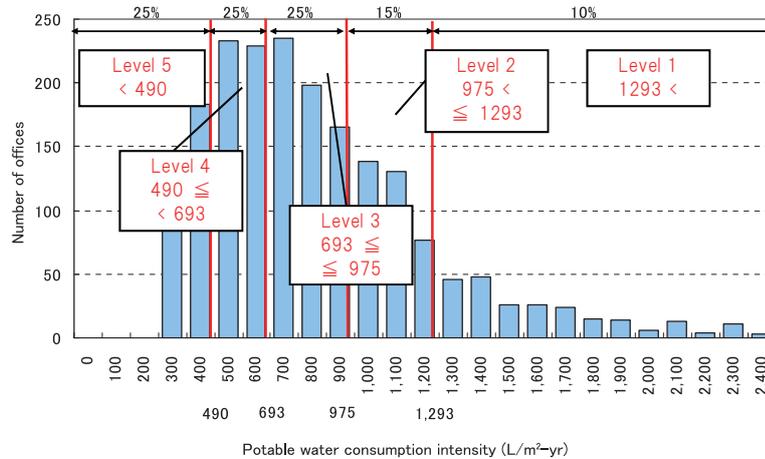


Figure II.23 Rank classification of water consumption intensity (Office administration area in store)

## (7) Suburban-style shopping facilities

The assessment of suburban-style shopping facilities is carried out by proportionally dividing retail stores, restaurants, department stores/supermarkets, office administration areas, and others by the floor space. Communal corridors are evaluated assuming the retail stores classification.

## (8) Assessment of actual potable water consumption of the entire building

In the assessment of actual potable water consumption of the entire building, in cases where multiple establishments falling into the above (1) to (7) business categories are located in the same building, the assessment result of each portion is proportionally divided by the floor space, the total of which serves as the assessment of the entire building.

In order to simplify the calculation, the assessment software includes a work sheet in which the proportional division is conducted. There are 2 types of work sheets to be selected depending on the procedure for potable water consumption measurements. Figure II.24 on the next page shows the one to be used when the potable water consumption is measured by business category. Figure II.25 shows the other to be used when the potable water consumption is measured in terms of the entire store portion.

The rater is allowed to select and use one from these 2 sheets at his/her discretion.

[1] In cases when actual figures in individual business categories are available in the assessment of energy and water

Enter in light-blue cells.  
Transcribe figures that appear in green cells to the assessment score column of the Store Assessment Result Sheet.

Composition ratio (excluding car park)	Composition ratio of the gross floor area	(1) Retail stores	(2) Restaurants	(3) Department stores/Supermarkets	(4) Home electronics mass retailers	(5) Convenience stores	(6) Office administration area of stores	(7) Others (deemed equivalent to retail stores)	Total
		0.00	3.000	0.00	0.00	5.000	0.00	0.00	8.000 1.00

←Enter the floor space of each purpose

Weighting per area

**1. Energy/GHG emissions**

\* In cases when C/S is obtained based on the BEI calculated according to the energy conservation standards revised in 2013, the entry of 1.1 (calculated value) below is unnecessary.

2.1 Use/Emission Intensity (Calculated value)	0							
2.2 Use/Emission Intensity (Actual value)	0							

←Enter the assessment result (15-25 points) by purpose  
←Enter the assessment result (1-5 points) by purpose

Standard boundary value of primary energy consumption (by store category)						Unit: MJ/m <sup>2</sup> -yr
	25% score	50% score	75% score	90% score	Target building	
(1) Retail stores	1,538	2,251	3,227	4,273		
(2) Restaurants	10,505	15,682	23,969	32,591		
(3) Department stores/Supermarkets (by scale)	6,250	7,510	8,870	10,450	9,502	
(4) Home electronics mass retailers	2,312	2,729	3,551	4,262		
(5) Convenience stores	10,968	12,673	15,686	17,847		
(6) Office administration area of stores	1,168	1,506	1,920	2,503		
(7) Others (deemed equivalent to retail stores)	1,538	2,251	3,227	4,273		

←Enter the actual primary energy consumption value (MJ/m<sup>2</sup>-yr) by purpose

**2. Water**

2.1 Water use (Calculated value)	0							
2.2 Water use (Actual value)	0							

←Enter the assessment result (1-5 points) by purpose  
←Enter the assessment result (1-5 points) by purpose

Standard boundary value of potable water consumption (by store category)						Unit: L/m <sup>2</sup> -yr
	25% score	50% score	75% score	90% score	Target building	
(1) Retail stores	404	1,102	1,731	3,089		
(2) Restaurants	14,205	21,053	30,404	36,641		
(3) Department stores/Supermarkets (by scale)	1,267	1,901	2,780	3,800		
(4) Home electronics mass retailers (deemed equivalent to retail stores)	404	1,102	1,731	3,089		
(5) Convenience stores	2,000	2,700	3,750	5,000		
(6) Office administration area of stores	490	693	975	1,293		
(7) Others (deemed equivalent to retail stores)	404	1,102	1,731	3,089		

←Enter the actual water consumption value (L/m<sup>2</sup>-yr) by purpose

Entry by business category

Entry by business category

Figure II.24 Work sheet in which the proportional assessment in store portions is conducted ([1] Retails score table)

[2] In cases where actual figures in individual business categories are unavailable in the assessment of energy and water (The measurement was conducted in terms of the entire building only.)

Enter in light-blue cells.  
Transcribe figures that appear in green cells to the assessment score column of the Store Assessment Result Sheet.

Composition ratio (excluding car park)	Composition ratio of the gross floor area	(1) Retail stores	(2) Restaurants	(3) Department stores/Supermarkets	(4) Home electronics mass retailers	(5) Convenience stores	(6) Office administration area of stores	(7) Others (deemed equivalent to retail stores)	Total
		0.00	3.000	0.00	0.00	5.000	0.00	0.00	8.000 1.00

←Enter the floor space of each purpose

Weighting per area

**1. Energy/GHG emissions**

\* In cases when C/S is obtained based on the BEI calculated according to the energy conservation standards revised in 2013, the entry of 1.1 (calculated value) below is unnecessary.

2.1 Use/Emission Intensity (Calculated value)	23.125		20			25		
2.2 Use/Emission Intensity (Actual value)								

←Enter the assessment result (15-25 points) by purpose  
\* Scores based on actual values are unnecessary in this sheet. Enter the assessment result in the assessment score column of the Store Assessment Result Sheet.

Standard boundary value of primary energy consumption (by store category)						Unit: MJ/m <sup>2</sup> -yr
	Composition ratio	25% score	50% score	75% score	90% score	Target building
(1) Retail stores	0.00	1,538	2,251	3,227	4,273	
(2) Restaurants	0.38	10,505	15,682	23,969	32,591	
(3) Department stores/Supermarkets (by scale)	0.00	6,250	7,510	8,870	10,450	
(4) Home electronics mass retailers	0.00	2,312	2,729	3,551	4,262	
(5) Convenience stores	0.63	10,968	12,673	15,686	17,847	
(6) Office administration area of stores	0.00	1,168	1,506	1,920	2,503	
(7) Others (deemed equivalent to retail stores)	0.00	1,538	2,251	3,227	4,273	
Target store (excluding car park)		10,794	13,801	18,792	23,376	22,500

←Enter the actual primary energy consumption value (MJ/m<sup>2</sup>-yr) of the entire store

**2. Water**

2.1 Water use (Calculated value)	0							
2.2 Water use (Actual value)								

\* Scores based on actual values are unnecessary in this sheet. Enter the assessment result in the assessment score column of the Store Assessment Result Sheet.

Standard boundary value of potable water consumption (by store category)						Unit: L/m <sup>2</sup> -yr
	Composition ratio	25% score	50% score	75% score	90% score	Target building
(1) Retail stores	0.00	404	1,102	1,731	3,089	
(2) Restaurants	0.38	14,205	21,053	30,404	36,641	
(3) Department stores/Supermarkets (by scale)	0.00	1,267	1,901	2,780	3,800	
(4) Home electronics mass retailers (deemed equivalent to retail stores)	0.00	404	1,102	1,731	3,089	
(5) Convenience stores	0.63	2,000	2,700	3,750	5,000	
(6) Office administration area of stores	0.00	490	693	975	1,293	
(7) Others (deemed equivalent to retail stores)	0.00	404	1,102	1,731	3,089	
Target store (excluding car park)		6,577	9,582	13,745	16,865	

←Enter the actual water consumption value (L/m<sup>2</sup>-yr) of the entire store

Figure II.25 Work sheet in which the proportional assessment in store portions is conducted ([2] Retails score table)

### 3. Materials/Safety

**[Prerequisite]** One of the following Items (1) to (3) is satisfied.

- (1) Compliance with the new earthquake-resistance standards (applicable to buildings constructed after the 1981 standards were introduced)
- (2) The seismic index of structure (Is-value) is 0.6 or more (applicable to buildings constructed before the 1981 standards were introduced, and seismic renovation has been completed)
- (3) The index of falling (If-value) is 1.0 or less (applicable to buildings constructed before the 1981 standards were introduced, and seismic renovation has been completed)

\*Regarding the assessment of existing buildings constructed before the new earthquake-resistance standards were introduced, and seismic renovation for the entire building has been determined, assessment may be carried out based on the renovation plan. If the renovation plan has been already begun and can steadily be carried out without obstructing occupancy by the tenants, assessment is carried out based on the final future performance to be achieved after the renovation.

Evaluation of the above Items (1) to (3) is conducted based on the details of documentation used as the basis of assessment.

#### Explanation

<Seismic index of structure: Is-value>

Is-value is an index of the earthquake-resistance of a building, and is used as a standard for determining the need for anti-seismic reinforcement based on the seismic diagnosis.

The Is-value is determined depending on the level of earthquake-resistance strength and tenacity of the building. The higher the Is-value is, the higher the seismic capacity of the building. A value of 0.6 or more indicates the required level of seismic capacity.

Even when the Is-value is more than 0.6, a building may collapse due to a high level of deformity. The new earthquake-resistance standards require the examination of the structural property sub-index (SD) and cumulative strength index (CT).

<Index of falling: If-value>

If the If-value (=Axial force/Axial load capacity) exceeds 1.0, the axial force acting on the pillars and columns during an earthquake may exceed the axial load capacity, increasing the risk of building collapse in the vertical direction. However, the If-value is not used in the new earthquake-resistance standards.

**[Additional point(s)]**

In addition to the required items, points are also given according to the following 3.1 to 3.4.

**3.1 High earthquake resistance, seismic isolation, etc.**

An assessment is carried out based on points for either of (1) Earthquake resistance or (2) Seismic isolation and vibration damping system, whichever is higher, as described below.

\* The assessment should be based on details of the basis of assessment form.

**(1) Earthquake resistance**

This assessment focuses on the earthquake resistance of the entire building. The increase rate of the earthquake-resistance performance as required in the Building Standards Act is targeted by the assessment.

**□Assessment standard**

Level 1	(Not applicable)
Level 2	(Not applicable)
Level 3	The earthquake resistance as specified in the Building Standards Act is confirmed.
Level 4	25% increase in the earthquake resistance as specified in the Building Standards Act is confirmed.
Level 5	50% increase in the earthquake resistance as specified in the Building Standards Act is confirmed or the damage control design is adopted.

**□Explanation**

Level 3 applies when the earthquake resistance is at the level as specified in the Building Standards Act. Levels 1 and 2 are not applicable as all buildings must meet the legal standards. Levels 4 and 5 are defined in consideration of the Housing Quality Assurance Act. Compared to Level 3, which meets the requirements specified in the Building Standards Act, Level 4 requires a 25% increase or more in the earthquake-resistance performance and Level 5 requires 50% increase or more. Buildings which adopt a damage control design are considered to have a high level of earthquake-resistance performance, and are classified as Level 5.

High-rise buildings 60 m or taller can be assumed to have the damage control design as described in Level 5, as they must undergo an earthquake response analysis and obtain a structure evaluation.

Refer to the following references when determining the increase in seismic capacity in Levels 4 and 5.

## 1) Allowable stress

Determine based on importance factors and seismic story shear coefficients to verify the increase in necessary horizontal strength.

## 2) Limit load-bearing calculation

Determine based on the increase in external force obtained at the structural calculation stage.

## 3) Time-history response calculation

Award Level 4 when the seismic ground motion value is 125% of the standard value (or the inter-story deformation angle is 1/1.25 or 80% of the standard value) and Level 5 when 150% (or 1/1.5)

## (2) Seismic isolation and vibration damping system

This assessment focuses on the presence or absence of seismic isolation and vibration damping systems.

### Assessment standard

Level 1	(Not applicable)
Level 2	(Not applicable)
Level 3	No seismic isolation and vibration damping systems are installed.
Level 4	A vibration damping system is installed.
Level 5	A seismic isolation system is installed.

### Explanation

This assessment item focuses on the vibration control performance of a building, which prevents or reduces the impact of shaking due to strong winds or earthquakes. Specifically, the assessment is carried out regarding the presence or absence of seismic isolation and vibration damping systems, which aim to improve the interior comfort during strong winds or to protect interior facilities, furniture and fixtures during an earthquake.

If a seismic isolation system is installed, the building is evaluated as Level 5, since it is expected to be able to protect interior facilities. Vibration damping for the improvement of interior comfort during strong winds is set as Level 4. However, installment of an earthquake mitigation system, which also functions to prevent shaking during strong winds, may be given Level 4, since it is considered to be equivalent to the installment of a vibration damping system.

Assessment of measures against long-period ground motion in high-rise buildings will be discussed in the future.

### 3.2 Utilization ratio of recycled materials/Control of waste disposal load

When evaluating stores, the assessment is carried out in terms of 3.2.1 and 3.2.2 below, respectively, and the score is up to 5 points each (10 points in total).

As for offices, the 3.2.2 Control of waste disposal load is excluded from the assessment.

#### 3.2.1 Utilization ratio of recycled materials

This assessment is carried out based on the number of recycled materials used for structural and non-structural applications.

This assessment is based on the average level of (1) Use of recycled materials in structural applications and (2) Use of recycled materials in non-structural applications.

For self-assessment (a certification system is not used), when it is difficult to inspect the construction materials required in this item, Level 3 for structural applications and Level 1 for non-structural applications can be awarded.

#### (1) Use of recycled materials in structural applications

This assessment is carried out based on use of recycled materials in structural applications (the main part in the structural strength).

Items subject to the assessment are "Eco Mark-certified products" approved by the Japan Environment Association, and structural applications of recycled materials out of "Designated Procurement Items" specified in "Law Concerning the Promotion of Procurement of Eco-friendly Goods and Services by the State and Other Entities" (Act on Promoting Green Purchasing) enacted in May 2000 (note that only items recognized as recycled materials out of the specified procurement items and Eco Mark-certified products are subject to the assessment).

#### □Assessment standard

Level 1	(Not applicable)
Level 2	(Not applicable)
Level 3	No recycled materials are used in the principal structural part.
Level 4	(Not applicable)
Level 5	Recycled materials are used in the principal structural part.

#### □Explanation

Main sections of structural strength are defined according to Article 1-3 of the Building Standards Act. (Applicable sections include the foundation, foundation piles, walls, columns, roof trusses, groundsills, diagonal bracing, floor slabs, roof shingles and girders.)

Excluding cases where the amount of these parts used is minimal, when such parts are used, even partially, they are regarded as being used in the assessment.

[Example of recycled materials for assessment]

1) Designated Procurement Items of the Act on Promoting Green Purchasing (Public construction)

Blast-furnace slag aggregate, ferronickel slag aggregate, steel slag aggregate, electric arc furnace oxidizing slag aggregate, portland blast-furnace cement (concrete), Fly Ash (FA) cement (concrete), eco-cement (concrete), lumber, recycled wooden boards

2) Eco Mark-certified "Boards using wooden materials" (Eco Mark Product Category No. 111)

3) Eco Mark-certified "Products using lumber from forest thinning and recycled or reused wooden materials" (Eco Mark Product Category No. 115)

The information regarding specified procurement items in the Act on Promoting Green Purchasing and Eco Mark-certified items is constantly updated. As such, the following websites should be checked when conducting an assessment:

- Information service system for specified procurement items listed in the Act on Promoting Green Purchasing (MOE; the service is currently suspended as of October 2013)  
<http://www.env.go.jp/policy/hozen/green/g-law/gpl-db/>
- Eco Product Net (Green Purchasing Network)  
<http://www.gpn.jp/econet/>
- Eco Mark product search site (the Japan Environment Association)  
<http://www.ecomark.jp/search/search.php>

## (2) Use of recycled materials in non-structural applications

This assessment is carried out based on the use of recycled materials in non-structural applications.

Items targeted in the assessment include "Eco Mark-certified products" approved by the Japan Environment Association and non-structural applications of recycled materials listed in the "Designated Procurement Items" as specified in "Law Concerning the Promotion of Procurement of Eco-friendly Goods and Services by the State and Other Entities" (Act on Promoting Green Purchasing) enacted in May 2000 (note that only items recognized as recycled materials out of the specified procurement items and Eco Mark-certified products are targeted in the assessment).

### □Assessment standard

Level 1	No recycled materials are used.
Level 2	(Not applicable)
Level 3	1 item of recycled materials is used.
Level 4	2 items of recycled materials are used.
Level 5	3 or more items of recycled materials are used.

### □Explanation

In cases where changes may occur due to requests from the tenants, an assessment may be carried out based on the building's standard specifications.

The assessment is based on a number of items from recycled material examples listed below. If multiple materials classified as a same item are used, the number of materials used is still counted as one, regardless of how many actual materials are used.

Excluding cases where the amount of these parts used is minimal, when such parts are used, even partially, they are regarded as being used in the assessment.

If one material is certified as both an "Eco Mark-certified product" and a "Designated Procurement Item," the number of materials used is counted as one.

The information regarding specified procurement items in the Act on Promoting Green Purchasing and Eco Mark-certified items is constantly updated. As such, the following websites should be checked when conducting an assessment.

- Information service system for specified procurement items listed in the Act on Promoting Green Purchasing (MOE; the service is currently suspended as of October 2013)  
<http://www.env.go.jp/policy/hozen/green/g-law/gpl-db/>
- Eco Product Net (Green Purchasing Network) <http://www.gpn.jp/econet/>
- Eco Mark product search site (the Japan Environment Association)  
<http://www.ecomark.jp/search/search.php>

Examples of recycled materials targeted in the assessment and a sample calculation are provided below for reference.

#### [Examples of recycled materials]

Assessment subjects	Material name
Designated procurement items according to the Green Purchasing Law	Treated soil from construction sludge
	Granulated blast furnace slag for earth work
	Caisson filling materials using copper slag
	Caisson filling materials using ferronickel slag
	Steel slag for Ground improvement
	Recycled heated asphalt compound
	Asphalt compound with steel slag
	Subgrade material compound with steel slag
	Steel slag blocks

Assessment subjects	Material name
	Shotcrete using FA Pavement blocks using recycled materials (Burnt) Pavement blocks using recycled materials (Precast unreinforced concrete products) Porcelain tiles Lumber Glued laminated timber Plywood Laminated veneer lumber Flooring Plywood board Laminated veneer lumber Vinyl floor materials
Eco Mark-certified tiles and blocks (Product category No. 109)	Tiles Blocks Bricks
Eco Mark-certified boards using wooden materials (Product category No. 111)	Boards
Eco Mark-certified products using lumber from thinning and recycled or reused materials (Product category No. 115)	Outdoor goods (Civil engineering and construction equipment: Small logs) Outdoor goods (Civil engineering and construction equipment: Laminated wood) Outdoor goods (Civil engineering and construction equipment: Plywood) Outdoor goods (Exterior decoration) Interior goods (Floor materials) Interior goods (Wall materials) Interior goods (Frames for fusuma doors) Interior goods (Doors) Activated carbon (Humidity control materials) Soil improvement materials
Eco Mark-certified construction products (Materials for interior finish work) (Product category No. 123)	Wood flooring Shoji (sliding screen)/Fusuma (sliding door) Shoji (sliding screen) paper/Fusuma (sliding door) paper Boards Tatami (straw mat) Wallpaper Heat insulation materials Acoustic absorption materials/Sound-proof and vibration-proof mats Vinyl flooring Antislip finishing for stairs Braille studs Free access floor Accordion doors
Eco Mark-certified construction products (Materials for exterior finish work and outdoor facilities) (Product category No. 137)	Roofing Roof materials Exterior materials Plastic deck materials Wood plastic recycled composite
Eco Mark-certified construction products (Ingredients and raw materials) (Product category No. 138)	Architectural stone materials Hard polyvinyl chloride pipes for water discharge and ventilation Housing land basin

## [Example of calculation]

Products A and B designated as bricks (Eco Mark product category No. 109), and C designated as porcelain tiles (Green procurement item) are used.

→ 1 brick item and 1 porcelain tile item, therefore 2 items in total are used (i.e. Level 4)

### 3.2.2 Control of waste disposal load

The maximum of 5 additional points is allowed in stores. The assessment covers efforts made in both communal areas and the tenant space in the building. In cases where different efforts are made in communal areas and the tenant space, the assessment focuses on common efforts made both in communal areas and the tenant space (the consideration of which is given to tenancy conditions).

This item is excluded from the assessment of offices.

#### □ Assessment standard

Level 1	The total points in the effort table subject to the assessment are less than 2.
Level 2	The total points in the effort table subject to the assessment are 4.
Level 3	The total points in the effort table subject to the assessment are 5. (4 points are given when there is no restaurants and food floors in the building.)
Level 4	The total points in the effort table subject to the assessment are 7. (5 points are given when there is no restaurants and food floors in the building.)
Level 5	The total points in the effort table subject to the assessment are more than 10. (7 points are given when there is no restaurants and food floors in the building.)

#### Measures for assessment

Assessment Item	Description	Point
I. Estimating the types and amount of waste	1) In order to develop measures for reducing the waste disposal load, individual stores estimate the types and amount of waste generated daily.	1
II. Securing space and installing equipment for promoting garbage separation	2) A garbage dump is established inside the building or in the communal area, which enables separate collection of various types of garbage.	1
	3) Separate garbage collection containers/boxes are placed inside the building.	1
	4) Scheduled collection of valuables is implemented. (i.e., Group collection, etc.)	1
III. Installing equipment for reducing volume/quantity of garbage or composting it	5) Measures for reducing volume/quantity of garbage, composting it, converting it into livestock feed or fertilizer are implemented. (Disposer, private processing of raw garbage, composting, biomass application, etc.)	1
	6) Measures for reducing volume/quantity of jars and cans are implemented.	1
IV. Recycling/Active waste reduction	7) Efforts associated with packaging, returnable containers, reusable hangers, etc.	1
	8) Reduction of food waste (Extended best-before dates, introduction of long-term storage containers, etc.)	1
	9) Efforts made in recycling dishes (weight saving, introduction of eco-trays, etc.)	1
	10) Efforts made in reuse of cooking oil	1
V. Maintenance/management and education	11) Systematized maintenance/management and continuous education regarding waste reduction are provided.	1

#### [Reference] Waste Disposal Law, Waste Disposal & Public Cleaning Law

The Waste Management and Public Cleaning Law (Act No. 137 of December 25, 1970) is a law designed to conserve the living environment and to improve the public health by controlling the discharge of waste and implementation of proper treatment thereof, which is called the Waste Disposal Law or the Waste Disposal & Public Cleaning Law for short, last amended as Act No. 28 of May 2, 2008.

The law classifies "Waste" broadly into industrial waste and general waste.

General waste is broadly classified into garbage (General household waste: Waste generated by individual households and General waste from business activities: Waste generated by businesses other than industrial waste) and human waste.

### 3.3 Service life of structural materials

This assessment focuses on the durability of structural materials used for the entire building.

Levels in the assessment are determined according to the Housing Quality Assurance Act, and depend on the grade of the building as defined in the Act. The housing performance indication system based on the Act is essentially limited to application in housing purposes. However, in this item, this system is used for the assessment for office buildings.

#### □Assessment standard

Level 1	(Not applicable)
Level 2	(Not applicable)
Level 3	Equivalent to Grade 1 in the assessment method standard for wooden, steel and concrete buildings (Ministerial Notification No. 1 of CAA/MLIT, 2013) as specified in the Housing Quality Assurance Act (3. Provisions for Reduction of deterioration, Japan Housing Performance Indication Standards)
Level 4	Equivalent to Grade 2 in the assessment method standard for wooden, steel and concrete buildings (Ministerial Notification No. 1 of CAA/MLIT, 2013) as specified in the Housing Quality Assurance Act (3. Provisions for Reduction of deterioration, Japan Housing Performance Indication Standards)
Level 5	Equivalent to Grade 3 in the assessment method standard for wooden, steel and concrete buildings (Ministerial Notification No. 1 of CAA/MLIT, 2013) as specified in the Housing Quality Assurance Act (3. Provisions for Reduction of deterioration, Japan Housing Performance Indication Standards)

#### □Explanation

This tool targets office buildings, which differs from the housing performance. However, the assessment covers office buildings which require measures to extend the period of duration specified in the Japan Housing Performance Indication Standards provided below.

Regarding existing buildings, the number of years since construction completion is added to the projected service life in the assessment.

Fiber reinforcement is excluded from the assessment in this item, since its major purpose is to prevent collapse due to explosion during a fire.

[Reference] Japan Housing Performance Indication Standards 3-1. Grades in measures against deterioration (structures, etc.)

Grades for measures against deterioration (structures, etc.)	Degree of measures required to extend the period of duration before a building needs a major renovation, such as replacement of materials used for structures and other parts.
Grade 3	Under the average natural environment, and maintenance conditions within the scope of the assumption, measures necessary to extend the interval before a building requires a major renovation large-scale renovation to three generations ( <u>approximately for 75 to 90 years</u> ) have been taken.
Grade 2	Under the average natural environment, and maintenance conditions within the scope of the assumption, measures necessary to extend the interval before a building requires a major renovation to two generations ( <u>approximately for 50 to 60 years</u> ), have been taken.
Grade 1	Measures specified in the Building Standards Act have been taken.

For details of individual measures, please refer to the assessment method standard provided in the Japan Housing Performance Indication Standards (Ministerial Notification No. 1 of CAA/MLIT, 2013).

### 3.4 Ease of MEP renewal/Self-sufficiency improvement of building services / Maintenance

This assessment is carried out based on the average level of (1) Required renewal interval for the main equipment, (2) Self-sufficiency improvement of the building services, and (3) Maintenance, described below (assessment is based on values to one decimal place).

#### (1) Required renewal interval for the main equipment

The assessment in this item focuses on the required interval until update and replacement of the main equipment. It also includes an evaluation of the management system regarding a long-term repair plan.

Main equipment includes the main facilities vital to the functioning of a building. Specifically, the assessment covers the power receiving and substation equipment, power generators, boilers, refrigerators, air-conditioners, water tanks, and pump units.

When renewal intervals differ depending on the type of main equipment, the average value of all the equipment is used in the assessment. For example, when the expected renewal interval for the power receiving and substation equipment is 30 years or more, and that for the heat source equipment is 20 years or more, the average is determined as  $(\text{Level 4} + \text{Level 5})/2 = 4.5$ .

#### Assessment standard

Level 1	Less than 7 years
Level 2	Between 7-15 years
Level 3	15 years
Level 4	Between 16-30 years
Level 5	30 years or more

#### Explanation

Level 3 is set at a legal service life of 15 years. Buildings with a renewal interval of 16-30 years are Level 4 and 30 years or more Level 5.

The availability of applicable documents, such as a long-term maintenance plan, should be indicated in the "Basis of assessment" form.

## (2) Self-sufficiency improvement of building services (electric power, etc.)

In an effort to enhance reliability during disaster, this assessment focuses on the basic stance of improving the self-sufficiency rate of the building services to the energy consumption.

Actions targeted by the assessment are described in the table below. Points are earned by counting the number of actions taken, and the total number of points are used for the assessment.

### □ Assessment standard

Level 1	No measure to improve self-sufficiency of the building services
Level 2	One measure to improve self-sufficiency of the building services taken
Level 3	Two measures to improve self-sufficiency of the building services taken
Level 4	Three measures to improve self-sufficiency of the building services taken
Level 5	Four or more measures to improve self-sufficiency of the building services taken

### Measures for assessment

Measure to improve self-sufficiency of the building services	Point
1) Electric power is supplied from emergency generators to the necessary load other than the load for disaster prevention purposes*.	1
2) The emergency generator is designed to operate for 24 hours or more.	1
3) Measures in case of a communication blackout during an emergency are taken.	1
4) Energy supply from a natural energy source is available.	1
5) Highly reliable and full-time power generating facilities are installed.	1

\* The necessary load other than the load for disaster prevention purposes includes drain pumps, a communication network power source, power supply to the disaster response headquarters and network servers.

### □ Explanation

The assessment in this item focuses on the self-sufficiency rate and the continuous operating capacity of the building services during an emergency. In connection with 4.4 Natural disaster risk management, the assessment covers conditions of the target building where the continuous operating capacity of related important facilities is secured in case of flooding or earthquake vibration, and the improved self-sufficiency rate based these conditions. The assessment in this item focuses on the basic stance rather than the details, examples of which are provided as follows.

- [1] Confirmation whether measures are taken in order to for the emergency generator to operate for a long time, such as specifications of a long-running power generator and fuel stock
- [2] Confirmation of measures for a communication blackout, such as emergency power supplies and the installment of multiple communication facilities
- [3] Consideration of long-running power generators and power generation by medium-pressure gases as highly reliable and full-time power generating facilities
- [4] Evaluation of measures for the use of natural energy (photovoltaic power generation, wind-power generation and biomass power generation) and the energy supply from full-time power generating facilities during a power outage
- [5] When applying for a certification system, if improvement of the energy self-sufficiency rate of the entire building, including the tenants, is planned, submission of the Material which forms the basis (entry column) is required.

**(3) Maintenance**

This item addresses maintenance within the scope of the cleaning management (cleaning of the inside and outside of the building) and the sanitation management (air quality, water supply, water discharge, pest control, and waste disposal), subject to the Sanitation Management Standards for Building.

**□ Assessment standard**

Level 1	No environmental measures in maintenance (Assessment points: 2 or less)
Level 2	Insufficient environmental measures in maintenance (Assessment points: 3 to 5)
Level 3	Standard environmental measures in maintenance (Assessment points: 6 to 8)
Level 4	Above-average environmental measures in maintenance (Assessment points: 9 to 11)
Level 5	Extensive environmental measures in maintenance (Assessment points: 12 or more)

## Measures for assessment

## I. Specified buildings in the Act on Maintenance of Sanitation in Buildings

Assessment Item	Description	Point
1) Business specifications	Environmental consideration is stated in the basic policy of specifications for the cleaning and facility management.	3
2) Contract style	In order to maintain a certain level of quality, the term of the service contract is for 2 years or more.	1
3) Operational process	An operational standard manual for the cleaning and facility management has been prepared.	3
4) Inspection	Inspection documents on the maintenance conditions of the cleaning and facility management are available.	2
5) Planning	A written plan covering the cleaning of the glass and lighting exposed to the air, has been prepared.	1
6) Staff education	Training plans and records on environmental issues, which are conducted more than once a year, are available.	2
7) EMS	The administrator has acquired the certification of the Environmental Management System (EMS) of an external assessment authority.	1

## II. Non-specified buildings in the Act on Maintenance of Sanitation in Buildings

Assessment Item	Description	Point
1) Frequency	Frequency of facility cleaning and equipment inspection/cleaning is set for each area.	3
2) Roles	A person in charge and a contracting company for facility cleaning and equipment inspection/cleaning are designated.	3
3) Operational process	Operational procedures and manuals for facility cleaning and equipment inspection/cleaning have been prepared.	3
4) Inspection	Inspection records of facility cleaning and equipment inspection/cleaning are available.	2
5) Implementation	Implementation records of facility cleaning and equipment inspection/cleaning are available.	1
6) Sharing	Opportunities to share inspection results of facility cleaning and equipment inspection/cleaning are provided.	1

## 4. Biodiversity/Site use

**[Prerequisite]** Appropriate actions are taken for the following matters:

Avoidance of immigrant fauna and flora (specified, unclassified, and caution required) is confirmed based on the following standards. Even in cases where the building has very few outdoor facilities, such avoidance should still be ensured on the premises, rooftop, and inside the building.

- (1) Specified alien species defined in the Invasive Alien Species Act
  - Confirm that no alien species is introduced due to building-related reasons (those which currently exist on the premises due to natural causes are excluded).
- (2) Unclassified alien species defined in the Invasive Alien Species Act
  - Confirm that no alien species is introduced due to building-related reasons (those which currently exist on the premises due to natural causes are excluded).
- (3) Alien Species requiring caution (based on the Request for Cooperation and Understanding of the Proper Handling of Alien Species by the Environment Ministry)
  - Confirm that no alien species is introduced due to building-related reasons (those which currently exist on the premises, even if they were brought in in the past, are excluded).

Progress of actions taken should be entered in the basis of assessment form when conducting the assessment.

### Explanation

Specified alien species are alien organisms (foreign species), which are harmful or likely to cause damage to the ecosystem, human life, human body, or the forestry and fisheries industries. Breeding, cultivation, preservation, distribution and import of specified alien species are generally prohibited, as well as the release or outdoor planting of such species.

Apart from the specified alien species, foreign species which may cause damage to the ecosystem, human life, human body, and the forestry and fisheries industries, or of which there is little information, are designated as unclassified alien species. When importing an unclassified alien species, one must notify the minister in charge in advance.

Breeding of alien species requiring caution is not regulated under the Invasive Alien Species Act. However, as such species may have an adverse impact on the ecosystem, the Environment Ministry asks for cooperation regarding the proper handling by individuals and companies involved in the utilization of those species.

(Refer to MOE website "Invasive Alien Species Act" for more details:

<http://www.env.go.jp/nature/intro/index.html>)

**[Additional point(s)]**

In addition to the required items, points are also given according to the following 4.1 to 4.4.

**4.1 Enhancement of biodiversity**

This assessment is carried out based on the following Items (1) or (2) regarding efforts to improve biodiversity on the premises.

**(1) Conducting assessment of biodiversity and obtaining certification**

This assessment focuses on efforts to improve biodiversity by utilizing certification tools including JHEP and JBIB. Buildings where efforts are made are evaluated as Level 4. Those which have obtained the certification and are rated as above a certain rank, are evaluated as Level 5.

**□Assessment standard**

Level 1	(Not applicable)
Level 2	No biodiversity measure taken
Level 3	(Not applicable)
Level 4	Some biodiversity measures taken (e.g. use of assessment tools such as JHEP and JBIB)
Level 5	A high level of biodiversity measures taken and verified by a third party by way of certification, etc. (e.g. JHEP Rank A or higher)

**□Explanation**

<JHEP (Japan Habitat Evaluation and Certification Program)>

JHEP is a certification system for quantitative assessment of efforts made for the preservation and restoration of biodiversity. Buildings are rated based on the increase of the habitat value over the next 50 years through business implementation over the standard assessment value (habitat value 30 years prior to benchmark year) and other factors (habitat quality, non-use of specified alien species, etc.), on a scale of one to ten (AAA, AA+, AA, A+, A, B, B-, C, C-, D). Rank A and higher require a positive increase of the habitat value.

Buildings which biodiversity initiatives based on the JHEP system are implemented earn Level 4. JHEP-certified buildings with Rank A and higher are awarded Level 5. For details, please see the Ecosystem Conservation Society website.

<http://www.ecosys.or.jp/eco-japan/activity/JHEP/index.html>

<JBIB (Japan Business Initiative for Biodiversity): Land Use Report Card>

The JBIB Land Use Report Card is designed to evaluate biodiversity preservation efforts implemented in company-owned lands such as office buildings and factories based on 17 items in 3 categories on a 100-point scale. The tool has been co-developed by the Japan Business Initiative for Biodiversity (JBIB), a group of proactive companies aimed to preserve biodiversity, and Tohoku University. The tool adopts a point system with focus on creation of environment which satisfies wildlife habitat requirements in green space or waterfront within business premises, maintenance, and its use. The land use report card is one of the three tools to promote coexistence between business and wildlife. Combined with the other two tools, the promotion guidelines and the wildlife survey sheet, employees with no expertise in this field can also participate in the continuous improvement of the land.

For details, please refer to the Japan Business Initiative for Biodiversity (JBIB) website.

<http://www.jbib.org/>

## (2) Assessment using list of measures

This assessment is carried out based on the total points calculated according to the following list of measures.

### □ Assessment standard

Level 1	(Not applicable)
Level 2	No measure taken (Assessment point: 0)
Level 3	One measure taken (Assessment point: 1)
Level 4	Two measures taken (Assessment points: 2)
Level 5	Three or more measures taken (Assessment points: 3)

### Measures for assessment

Item	Content	Point
1) Conservation of natural resources (Counted as 1 point, if no natural resources to be conserved is determined)	The vegetation of the existing forests is taken into consideration and a certain amount of the natural resources are conserved.	1
2) Creation and preservation of biodiversity	Biodiversity is taken into consideration.	1
3) Creation of environment with consideration to natural vegetation in surrounding area	Greenery plan developed with consideration to vegetation in surrounding area.	1
4) Total green space (including green spaces on the rooftops, walls and water surfaces, contributing to the ecosystem)	The ratio of greening in the land use plan is 20% or more. (In the overall assessment, the ratio between the green area and the site area is determined to be sufficient.)	1
5) Management and utilization of biological resources	Facilities required for the maintenance of green areas during operation of the building are installed, and management policies are presented. Alternatively, an environment or facility which the users of the building and local residents can come into contact with living creatures and nature, are secured.	1

### □ Explanation

#### 1) Conservation of natural resources

This assessment focuses on efforts to conserve green spaces, including forests and tree lines on the premises existed prior to development.

#### 2) Creation and preservation of biodiversity

The assessment focuses on a plan, in which natural environment such as sanctuaries and biotopes are secured or established as areas to be inhabited by various species of birds and insects.

#### 3) Creation of environment with consideration to natural vegetation in surrounding area

The assessment focuses on an open space planning, based on native plant species which can adapt to the climate characteristics of the target area. The exclusion of specified alien species is a requirement.

#### 4) Total green space

This assessment focuses on a plan where a certain amount of green spaces is secured over the entire premises, taking the ecosystem into consideration.

The assessment is carried out based on the ratio of greening, using the following equation.

$$\text{Ratio of greening} = \frac{\text{Green area on the premises}}{\text{Site area}}$$

\* The green area of the premises may include green spaces on the rooftops, walls and water surfaces, which are regarded as being beneficial to the ecosystem. Pallet- and sheet-style green spaces on the rooftops are excluded from the calculation of the green area.

## 4.2 Soil environmental quality/Regeneration of brownfield sites

This assessment focuses on application status of the target site with regards to the Soil Contamination Countermeasures Act, from the viewpoint of utilization of brownfield sites.

When sites are not designated as areas requiring action such as decontamination according to the Soil Contamination Countermeasures Act, assessment for this item is not applicable. In such a case, the point(s) scored in 4.1 Enhancement of biodiversity can be doubled (max. 10 points).

### Assessment standard

Level 1	(Not applicable)
Level 2	(Not applicable)
Level 3	(Not applicable)
Level 4	Sites which have been designated as areas requiring an application for land character change as a result of a legal or voluntary survey, and for which a non-proliferation plan has been submitted at the time of development and specific measures based on the plan have been taken
Level 5	Cases where the area designation has been legally is cancelled as a result of voluntarily carrying out measures to remove pollution

### Explanation

Sites which require survey based on the Soil Contamination Countermeasures Act include, (1) cases where a specified facility using hazardous substances has become obsolete (for which notice has been filed) (Article 3), (2) application for land character change for a site 3000 m<sup>2</sup> or more (Excavation and filling of 3000 m<sup>2</sup> or more) and the local government has determined that soil contamination may have occurred (Article 4), and (3) when the local government determines, as a result of groundwater surveys and other studies, that there is a cause for health risks (Article 5).

If the site is designated as an area requiring application for land character change as a result of legal survey, due to soil contamination exceeding the designated standard, and a non-proliferation plan is submitted at the time of development (at the time of land character change), and specific measures based on the plan have been taken, the site is evaluated as Level 4.

If the site is designated as an area requiring measures, as a result of legal survey, due to soil contamination exceeding the designated standard, and is then later designated as an area requiring application for land character change after blocking the flow of pollution, and a non-proliferation plan is submitted at the time of development and specific measures based on such plan are taken, the site is also evaluated as Level 4.

Furthermore, if the site is voluntarily designated as a contaminated area, due to the soil contamination detected as a result of a voluntary survey, and development is carried out according to the above described process, the site is evaluated as Level 4.

Even when a site is designated as an area requiring measures or an application for land character change as a result of legal survey or voluntary survey, if the area designation is cancelled after taking the measures to remove pollution voluntarily, this is regarded as proactive proper utilization of the brownfield site, and the site is evaluated as Level 5.

### 4.3 Public transportation accessibility

This assessment focuses on the reduction of GHG emissions through the use of public transportation instead of driving by the building users. Such accessibility helps the conservation of greenfield sites through increased urban concentration.

#### Assessment standard

Level 1	Level 3 is not satisfied
Level 2	(Not applicable)
Level 3	Standard level of train station within 15 minutes of walk or bus stop within 5 minutes of walk
Level 4	(Not applicable)
Level 5	Standard level of train station within 8 minutes of walk or bus stop within 3 minutes of walk

#### Explanation

A standard level of train stations and bus stops are those which provide transportation services that sufficiently meet transportation demands of commuters in the area (including shuttle buses).

Minutes are calculated by walking at 80 m/minute pursuant to the Fair Competition Codes Regarding the Description of Real Estate.

#### 4.4 Natural disaster risk management

This assessment focuses on the details of various disaster hazard maps and corresponding disaster-prevention measures incorporated in a land use plan. Such disasters include flood, liquefaction, tsunami, seismic movement, slope disaster and others at the target site. The assessment is based on the total number of risks identified using the following natural disaster list and implementation of risk management measures.

##### □Assessment standard

Level 1	No disaster information verified or total of 5 risk types or more
Level 2	Total of 4 risk types or less and no special disaster-prevention measures in place
Level 3	Total of 3 or 4 risk types and effective disaster-prevention measures in place
Level 4	Total of 2 risk types and effective disaster-prevention measures in place
Level 5	Zero or 1 risk type and effective disaster-prevention measures in place

##### □Explanation

The table below shows items related to natural disaster risks which should be confirmed and handled. When the disaster risks are low, the site "foundation" is evaluated as high quality. On the other hand, the standards in the assessment are designed to provide a fair assessment even of sites where risks are detected and the necessary measures are taken. Levels 3 and 4 are only applicable to cases where the number of risk types without any countermeasures is one or none.

##### Items for natural disaster risks requiring confirmation and countermeasures

Hazard type	Disaster information	Progress on information disclosure	Information source	Conditions applicable to risks
(1) Flood				Applicable to one of the following
	Flood hazard map	According to the individual municipal governments	MLIT/Hazard map portal site <a href="http://disapotal.gsi.go.jp/index.html">http://disapotal.gsi.go.jp/index.html</a>	Expected depth of floodwater exceeds 50 cm
	Inland flood hazard map	Same as above		Same as above
	High tide hazard map	Same as above		Same as above
(2) Liquefaction	Liquefaction map	According to the individual municipal governments	MLIT/Hazard map portal site/Earthquake disaster-prevention and hazard map <a href="http://disapotal.gsi.go.jp/bousaimap/index.html?code=1">http://disapotal.gsi.go.jp/bousaimap/index.html?code=1</a>	Applicable to the highest or the second highest in the hazard ranking system
(3) Tsunami	Tsunami hazard map	According to the individual municipal governments	MLIT/Hazard map portal site <a href="http://disapotal.gsi.go.jp/index.html">http://disapotal.gsi.go.jp/index.html</a>	Range affected by flooding
(4) Seismic movement	National seismic hazard map	Common nationally	Headquarters for Earthquake Research Promotion/Earthquake hazard station J-SHIS/Start/ "Projected earthquakes = All earthquakes" "Average cases" <a href="http://www.j-shis.bosai.go.jp/map/">http://www.j-shis.bosai.go.jp/map/</a>	Probability of an earthquake with a magnitude of lower 6 or greater over the next 30 years is 26% or more
(5) Slope disaster				Applicable to one of the following
	Distribution map of the natural terrain landslide	Common nationally	Headquarters for Earthquake Research Promotion /Earthquake hazard station J-SHIS/Start/Natural terrain landslide <a href="http://www.j-shis.bosai.go.jp/map/">http://www.j-shis.bosai.go.jp/map/</a>	Area assumed as a slope mobile body or an unstable region/a moving region
	Steep slope area in danger of failure	According to the individual municipal governments	<Example of Kanagawa Prefecture> Kanagawa/Life•Safety•Environment/Disaster prevention and safety/Disaster prevention and fire-fighting/Landslide hazard map/Search and display for landslide hazards <a href="http://www.pref.kanagawa.jp/osirase/sabo/bousai/dosha/imgmap.html">http://www.pref.kanagawa.jp/osirase/sabo/bousai/dosha/imgmap.html</a>	Applicable to the steep slope area in danger of failure
(6) Lightning strike	IKL map (Distribution map of annual thunderstorm days)	Common nationally	"Distribution map of annual thunderstorm days" uploaded on websites of manufacturers, such as Fuji Electric Co., Ltd. (Source: "10-year storm report," 1968, Japan Meteorological Agency) <a href="http://www.fujielectric.co.jp/technica/QA/32a/qa_">http://www.fujielectric.co.jp/technica/QA/32a/qa_</a>	Areas in which IKL is 35 or more

The assessment process is as follows.

**Step 1: Confirmation of natural disaster risks**

- Based on the above-mentioned natural disaster risks, verify whether the target site has such risks.
- When no disaster information is available online, contact a municipal government in charge.

**Step 2: Confirmation of disaster-prevention countermeasures (examples)**

- If the target site has risks, verify whether effective disaster-prevention measures are in place.
- Measures such as establishment of evacuation routes are excluded.
- Examples of effective disaster-prevention measures:
  - (1) Flood  
Installation of waterproof boards or sandbags, living space is not located underground or on lower floors, emergency power generation devices, etc.
  - (2) Liquefaction  
Foundation reinforcement, ground improvement, etc.
  - (3) Tsunami  
Living space is not located underground or on lower floors, main devices are installed on rooftop, etc.
  - (4) Seismic movement  
Vibration damping devices, seismic isolation devices, appropriate seismic upgrade renovations, etc.
  - (5) Slope disaster  
Horizontal drainage drilling, ground anchors, grating crib works, etc.
  - (6) Lightning strike  
Lightning rods, current overload protection facilities, intensive grounding, etc.

## 5. Indoor environment

**[Prerequisite]** One of the conditions of (1) or (2) below is satisfied (Apply to Office/Retails)

### (1) Compliance with the management standard of environmental sanitation for buildings

The management standard of environmental sanitation for buildings is satisfied (with a few exceptions in terms of measurement locations). Compliance is confirmed based on the maintenance report submitted to the local government in accordance with the Act on Maintenance of Sanitation in Buildings (a.k.a. Building Health Law).

Submission of formaldehyde data is not required if recent measurements are not available.

**[Reference]** Air quality standard for buildings where air-conditioners are installed (Management Standard of Environmental Sanitation for Buildings)

Management item	Management standard
Amount of airborne dust	0.15 mg/m <sup>3</sup> or less
Content rate of carbon monoxide	10 ppm or less (20 ppm or less if carbon monoxide level in the outside air is too high)
Content rate of carbon dioxide	1,000 ppm or less
Temperature	17°C or more to 28°C or less
Relative humidity	40% or more to 70% or less
Airflow	0.5 m/s or less
Amount of formaldehyde	0.1 mg/m <sup>3</sup> or less

### (2) Assessment using questionnaire

If the target building is not a specified building (gross floor area is 3000 m<sup>2</sup> or more) in the Act on Maintenance of Sanitation in Buildings, an assessment based on Item (1) is difficult. Alternatively, the assessment can be carried out based on questionnaires listed below. In principle, appropriate actions must be taken for all items in order to satisfy the requirements.

#### Sanitation management questionnaire

Questions	Answers
1-1. Is fresh air properly circulated at a rate greater than 20m <sup>3</sup> /hour according to the number of persons in the office?	
1-2. Does the exhaust provide sufficient ventilation in the office?	
1-3. Are filters installed in the air-conditioners?	
1-4. Are filters in the air-conditioners cleaned regularly?	
2. Is the temperature maintained within 17-28°C?	
3. Is the relative humidity maintained within 40-70%?	
4. Is the airflow maintained at 0.5 m/s or less?	
5. Are the interior materials and furniture selected with a view of reducing formaldehyde generation?	
6. Is the ventilation in the parking lot sufficient?	
7. Has someone been appointed to manage the sanitation standards?	

**[Additional point(s)]**

In addition to the required items, points are also given according to the following Items 5.1 to 5.3.

**5.1 Use of daylight**

Levels in the following Items [1] and [2] are calculated by multiplying by a weighing factor of 2/3 and 1/3, respectively.

**[1] Natural daylight**

[Office]

For simplicity, the assessment is carried out according to the ratio of effective aperture area for natural daylight (window ratio) and the floor space of a representative living area.

**□ Assessment standard**

Level 1	[Window ratio] < 10%
Level 2	(Not applicable)
Level 3	$10\% \leq [\text{Window ratio}] < 15\%$
Level 4	$15\% \leq [\text{Window ratio}] < 20\%$
Level 5	$20\% \leq [\text{Window ratio}]$

**□ Explanation**

Window ratio is used to carry out a simplified assessment to indicate the possible introduction of natural light from openings, using "Aperture area/Floor space (%)." The higher the value, the higher the target building is rated. However, as aperture area increases, the need to control heat (solar radiation) and dizziness (glare) also increases. Therefore, aperture areas should be designed in consideration of adjustment functions for heat and dizziness.

In the Daylight of an living area section in the Building Standards Act, the minimum ratio of window space is set at 1/10 in buildings other than residential houses. Although this rule does not apply to living areas in office buildings, the assessment is carried out based on this concept.

[Reference] Use of daylight and ventilation in a living area specified in the Building Standards Act  
**Article 28** In living areas of houses, schools, hospitals, clinics, dormitories, boarding houses and other similar kinds of buildings specified in the government regulation (residential spaces of houses, classrooms in schools, patients' rooms in hospitals, and other similar spaces specified in the government regulation), windows and other open spaces for daylight shall be provided. The ratio of areas for effective use of daylight shall be one-seventh or more of the floor space of the living area in a residential house, and more than one-tenth to one-fifth in other buildings as specified in the government regulation. However, this shall not apply to living areas located underground, in an underground structure, or a similar structure, or to rooms etc. where work requires adjustment in temperature and humidity, according to the function of the building.

When calculating the window ratio, mullions of sash windows and sash bars may be ignored in the aperture area.

For example, in the case of a 20 m long office building with a ribbon window (windows in a continuous horizontal band), the window height required for effective use of daylight is defined as H, and Levels 1, 3, 4 and 5 are expressed as  $H < 2$  m,  $2 \text{ m} \leq H < 3$  m,  $3 \text{ m} \leq H < 4$  m and  $4 \text{ m} \leq H$ , respectively.

In the case of a 15 m long office building with a ribbon window, the window height required for effective daylight is defined as H, and Levels 1, 3, 4 and 5 are expressed as  $H < 1.5$  m,  $1.5 \text{ m} \leq H < 2.25$  m,  $2.25 \text{ m} \leq H < 3$  m and  $3 \text{ m} \leq H$ , respectively.

[Retails]

- In order to simplify the procedure, the assessment is based on the percentage of effective opening area for natural lighting to the floor space (Aperture ratio) in a representative of target rooms indicated below.
- The assessment is carried out in terms of individual applicable purposes, the values of which are proportionally divided by the floor space. The assessment of suburban-style shopping facilities is based on the individual purposes divided proportionally by the floor space.
- The aperture ratio is the percentage of the total area, including glass openings on outer walls and at the entrance, skylight, high-side light and the like, to the floor space.

(1) Retail stores: The assessment is based on a representative room on a representative floor in the sales area or a representative zone of communal areas. In cases where inner walls are installed to cover windows in order to protect goods from sun damage, the assessment is carried out in terms of outer windows.

**□Assessment standard**

Level 1	[Aperture ratio] < 5%
Level 2	5% ≤ [Aperture ratio] < 10%
Level 3	10% ≤ [Aperture ratio]
Level 4	10% ≤ [Aperture ratio] And, there is an open mall, outdoor terrace or the like on the ground floor, intermediate floor or the rooftop.

\* An open mall is a row of shops facing an open-air communal street.

(2) Restaurants: The assessment is based on a representative zone on a representative floor of a restaurant building or a representative zone of communal areas. (Restaurant district, food court, etc.)

**□Assessment standard**

Level 1	[Aperture ratio] < 5%
Level 2	5% ≤ [Aperture ratio] < 10%
Level 3	10% ≤ [Aperture ratio]
Level 4	10% ≤ [Aperture ratio] And, there is an open mall, outdoor terrace or the like on the ground floor, intermediate floor or the rooftop.

(3) Department stores/Supermarkets (including the food floor): The assessment is based on a representative zone on a representative floor of a restaurant building or a representative zone of communal areas. When there is no applicable zone, the building is excluded from the assessment (fixed at Level 1).

**□Assessment standard**

Level 1	[Aperture ratio] < 5%
Level 2	5% ≤ [Aperture ratio] < 10%
Level 3	10% ≤ [Aperture ratio]
Level 4	10% ≤ [Aperture ratio] And, there is an open mall, outdoor terrace or the like on the ground floor, intermediate floor or the rooftop.

(4) Home electronics mass retailers: The assessment is based on a representative zone on restaurant floors or that of communal areas. When there is no applicable zone, the building is excluded from the assessment (fixed at Level 1).

**□Assessment standard**

Level 1	There is no window for natural lighting, an open mall or outdoor terrace.
Level 2	(No applicable level)
Level 3	There is at least a window for natural lighting.
Level 4	There is an open mall, outdoor terrace or the like on the ground floor, intermediate floor or the rooftop.

(5) Convenience stores: The assessment is carried out in terms of the entire building.

**□Assessment standard**

Level 1	[Aperture ratio] < 10%
Level 2	(No applicable level)
Level 3	10% ≤ [Aperture ratio] < 15%
Level 4	15% ≤ [Aperture ratio]

(6) Office administration area: The office administration area of stores falls into the back-office category, which is excluded from the assessment.

(7) Suburban-style shopping facilities: The assessment is based on the above purposes proportionally divided by the floor space.

**□Explanation**

Window ratio is used to carry out a simplified assessment to indicate the possible introduction of natural light from openings, using "Aperture area/Floor space (%)." The higher the value, the higher the target building is rated. However, as aperture area increases, the need to control heat (solar radiation) and dizziness (glare) also increases. Therefore, aperture areas should be designed in consideration of adjustment functions for heat and dizziness.

On sales floors of a shop building, it is important to secure walls that protect goods from sun damage and serve as store shelves. Therefore, the assessment of the entire building needs to be adjusted according to the business category of the store and purpose of the room. The aperture ratio has also a relaxed standard compared to that of offices. On the other hand, reduced power consumption for lighting due to natural lighting from openings shall be highly evaluated.

When calculating the window ratio, mullions of sash windows and sash bars may be ignored in the aperture area.

**[2] Building services using daylight**

The assessment is based on the number of building services using daylight that are installed anywhere in the building.

**□Assessment standard**

Level 1	(Not applicable)
Level 2	(Not applicable)
Level 3	No building services using daylight
Level 4	One type of building services using daylight
Level 5	Two or more types of building services using daylight or with high-functioning facility

**□Explanation**

Building services using daylight is defined as equipment installed to proactively utilize daylight, in addition to regular windows installed in the outer walls of a building. Specifically speaking, daylight devices include light condensing apparatuses such as a skylight, high-side light, light shelf, light duct, beam-condensing unit and optical fiber, or an apparatus that induces light to the back of a room. Facilities having advanced functions include, for example, an apparatus in which a beam-condensing unit and optical fibers are combined, which has both the functions of light condensing and leading light to the back of a room. Use of daylight devices in stores is mainly for the increased visibility both inside and outside the building, which would also contribute to the reduced power consumption for lighting.

## 5.2 Natural ventilation performance

[Office]

This assessment focuses on whether openable windows (those which facilitate natural ventilation) are sufficiently located in a representative room of an office building.

The assessment is carried out based on the ratio of effective aperture area for natural ventilation to the floor space of a living area, as targeted in the assessment described in 5.1.

Rooms with mechanical ventilation, fixed windows, and no effective aperture for natural ventilation are rated as Level 3.

### □ Assessment standard

Level 1	Level 3 is not satisfied
Level 2	(Not applicable)
Level 3	Effective aperture for natural ventilation is less than $25 \text{ cm}^2/\text{m}^2$ in room with fixed windows or 1/50 or larger in proportion to floor space of the room
Level 4	Effective aperture for natural ventilation is $25 \text{ cm}^2/\text{m}^2$ or larger in room with fixed windows or 1/30 or larger in proportion to floor space of the room. Alternatively, improvement of indoor air quality via outdoor air cooling (that produces more than twice the amount of required outer air) is reasonably expected
Level 5	Effective aperture for natural ventilation is $50 \text{ cm}^2/\text{m}^2$ or larger in room with fixed windows or 1/15 or larger in proportion to floor space of the room. Alternatively, Level 4 is satisfied while improvement of indoor air quality via outdoor air cooling (that produces more than twice the amount of required outer air) is reasonably expected

### □ Explanation

This assessment is generally based on the precondition that the required amount of outer air is secured by air-conditioning and ventilation equipment. However, in some cases, emissions of pollutants temporarily exceed the estimated maximum depending on how the living area is used, or improvement of air quality by the temporary introduction of outside air is desirable, according to the individual physical conditions or other reasons, even though the density of pollutants is not harmful. The introduction of natural air through open windows is significant since this can be controlled voluntarily as necessary.

Smoke-control windows designed for natural ventilation, which can be easily opened or closed and used according to the request from residents, may be regarded as natural ventilation apertures.

Outer air cooling mainly focuses on energy-saving. However, since it is expected to improve the indoor air quality in a practical sense, if the ventilation volume uses more than twice the amount of required outer air, the office room is rated as Level 4 or Level 5, depending on the conditions.

For example, for a 15 m-long office room, the window opening required for Level 3 is equivalent to a 30-centimeter-high openable ribbon window. The height of the ribbon window for Level 4 and Level 5 corresponds to 50 cm and 100 cm, respectively.

**[Retails]**

The assessment is carried out regarding a representative of target rooms in terms of each applicable purpose, which is proportionally divided by the floor space. The maximum additional points allowed for stores are up to 4 points.

- (1) Retail stores: The assessment is based on a representative room on a representative floor in sales areas, or a representative zone of communal areas.
- (2) Restaurants: The assessment is based on a representative zone on a representative floor in a restaurant building, or a representative zone of communal areas. (Restaurant district, food court, etc.)
- (3) Department stores/Supermarkets (including the food floor): The assessment is based on a representative zone on restaurant floors, or a representative zone of communal areas.
- (4) Home electronics mass retailers: The assessment is based on a representative zone on restaurant floors, or a representative zone of communal areas.
- (5) Convenience stores: Excluded from the assessment. The maximum points allocated in 5.1 Use of daylight are up to 8 points, and the assessment level is doubled.
- (6) Office administration area: The assessment is based on a representative room on a representative floor.
- (7) Suburban-style shopping facilities: The assessment is based on the above purposes proportionally divided by the floor space.

The assessment is carried out based on whether there are effective openings for natural ventilation necessary for the floor space of the room specified above. Additionally, open malls and outdoor terraces are also included in the assessment. In cases where the duration of time openings are effective is limited in order to protect goods from sun damage or dust, the assessment is carried out as to whether openable and closable openings are provided.

**□ Assessment standard**

Level 1	There is no effective opening for ventilation on sales floors.
Level 2	There are effective openings for ventilation on sales floors.
Level 3	There is an open mall, outdoor terrace or the like on the ground floor, intermediate floor or the rooftop.
Level 4	There are effective openings for natural ventilation on sales floors; and there is an open mall, outdoor terrace or the like on the ground floor, intermediate floor or the rooftop.

\* An open mall is a row of shops facing an open-air communal street.

**□ Explanation**

This assessment is generally based on the precondition that the required amount of outer air is secured by air-conditioning and ventilation equipment. However, in some cases, emissions of pollutants temporarily exceed the estimated maximum depending on how the living area is used, or improvement of air quality by the temporary introduction of outside air is desirable, according to the individual physical conditions or other reasons, even though the density of pollutants is not harmful. The introduction of natural air through open windows is significant since this can be controlled voluntarily as necessary.

Smoke-control windows designed for natural ventilation, which can be easily opened or closed and used according to the request from residents, may be regarded as natural ventilation apertures.

### 5.3 View

[Office]

This assessment focuses on ceiling height and windows in a representative office room.

The average ceiling height of the target office room is considered to be the ceiling height used in the assessment.

#### Assessment standard

Level 1	Level 3 is not satisfied
Level 2	(Not applicable)
Level 3	Ceiling height of office room 2.5 m or higher and windows offering all occupants sufficient awareness of outside environment installed
Level 4	Ceiling height of office room 2.7 m or higher and windows offering all occupants sufficient awareness of outside environment installed
Level 5	Ceiling height of office room 2.9 m or higher and windows offering all occupants sufficient awareness of outside environment installed

#### Explanation

Areas which give an effect of spaciousness and provide a view for the building users, should be valued highly from the psychological and comfort viewpoint. The assessment is carried out based on the average ceiling height, taking the shape of beams into consideration. Ceiling height discussed here does not necessarily give a direct explanation of comfort. However, the effect of ceiling height is expected to bring various benefits, including a feeling of spaciousness and openness.

Buildings, which barely satisfy related laws and regulations, or which meet the standard normally required at this time are assessed as Level 3. Buildings which are highly rated in view of past cases are assessed as Level 5.

The above "windows offering all occupants sufficient awareness of outside environment" describe windows that have no obstacles that interrupt the occupants' view and are equipped with glass clear enough to provide visual information of the outside.

### 5.3 View/Visual environment

[Retails]

Apart from the view, stores have openings for purposes associated with visibility regarding the situation inside and outside the building and security functions, regarding which the assessment is carried out. The maximum additional points allowed are up to 2 points in stores.

The assessment is carried out as to whether there is sufficient ceiling height and windows in a representative of the target rooms as indicated below.

The ceiling height shall be the average ceiling height in the area concerned.

- (1) Retail stores: The assessment is based on a representative room on a representative floor in sales areas or a representative zone of communal areas. In cases where inner walls are installed to cover windows in order to protect goods from sun damage, the assessment is carried out in terms of outer windows.
- (2) Restaurants: The assessment is based on a representative zone on a representative floor in a restaurant building. (Restaurant district, food court, etc.)
- (3) Department stores/Supermarkets (including the food floor): The assessment is based on a representative zone on a representative floor in a restaurant building.
- (4) Home electronics mass retailers: The assessment is based on a representative zone on restaurant floors.
- (5) Convenience stores: The assessment is based on the entire building.
- (6) Suburban-style shopping facilities: The assessment is based on communal corridors on the entrance floor or the entrance.

#### Assessment standard

Level 1	Requirements for Level 2 are not satisfied.
Level 2	The ceiling height is more than 3.0 m, and there are windows from which visitors are able to obtain sufficient information from outside.

\* The standard ceiling height for convenience stores shall be 2.5m or over (equivalent to Level 3 for offices).

#### Explanation

Areas which give an effect of spaciousness and provide a view for the building users, should be valued highly from the psychological and comfort viewpoint. The assessment is carried out based on the average ceiling height, taking the shape of beams into consideration. Ceiling height discussed here does not necessarily give a direct explanation of comfort. However, the effect of ceiling height is expected to bring various benefits, including a feeling of spaciousness and openness.

Buildings, which barely satisfy related laws and regulations, or which meet the standard normally required at this time are assessed as Level 3. Buildings which are highly rated in view of past cases are assessed as Level 5.

The above "windows offering all occupants sufficient awareness of outside environment" describe windows that have no obstacles that interrupt the occupants' view and are equipped with glass clear enough to provide visual information of the outside.

## References

### 1. Calculation method of "operational" CO<sub>2</sub> emissions (excerpt from current CASBEE tool\*)

\* CASBEE for Building (Existing Building) (2014 edition) Pt.3

#### (1) Basic principles and key points

(1) Basic principles and key points

Key points in the calculation method for CO<sub>2</sub> emissions in the operational phase (standard calculation) are as follows.

- [1] Based on the assessment result of medium items evaluated in "LR1 Energy", the calculation of CO<sub>2</sub> emissions is carried out.
- [2] The assessor selects the appropriate values for the emissions coefficients of electricity used for the calculation of CO<sub>2</sub> emissions, according to the assessment purpose. The assessment tool allows the use of the latest values for actual emissions coefficients and substitute values at the time of updating CASBEE 2014 edition (measured values in 2012 and published values in December 2013), as well as other values which the assessor arbitrarily selects as appropriate emissions coefficients, based on the provisions of Article 2, paragraph 4 of the Ministerial Ordinance regarding the calculation of GHG emissions caused by business activities of specified emitters.
- [3] In the calculation of CO<sub>2</sub> emissions in the operational phase, for the sake of simplicity, the primary energy consumption shall be converted into the CO<sub>2</sub> emissions.
- [4] In the assessment, energy consumption at the time of assessment is regarded as that of the operational phase. Since data collection and input for different energy purposes of each building by the assessor is considered to be very difficult, actual repairs, renovations, and changes due to the age-related deterioration, are excluded from the calculation.

(2) Buildings other than housing complexes

In addition to the key points listed in (1),

- [1] CO<sub>2</sub> emissions of the target building are calculated based on measured consumption of various energy types.
- [2] Calculation of CO<sub>2</sub> emissions in a reference building is carried out using the estimated consumption ratios for each energy type and the corresponding intensity derived from estimates and emissions coefficients.

Notes) In terms of factories (including car park), the energy consumption associated with production facilities is excluded from the assessment. In other words, the assessment focuses on facilities subject to the energy saving plan, the energy consumption for which is measured separately or estimated, and is converted into the CO<sub>2</sub> emissions. The CO<sub>2</sub> emissions in a reference building (per floor space) shall be assumed equal to the CO<sub>2</sub> emissions that are estimated based on the actual statistical average of the energy consumption.

#### A. CO<sub>2</sub> emissions in a building targeted in the assessment

[1] Estimated CO<sub>2</sub> emissions of the target building

CO<sub>2</sub> emissions of the target building are calculated by multiplying the measured consumption of each energy types by the CO<sub>2</sub> emission intensity of each energy type, and then adding their products.

The CO<sub>2</sub> emissions coefficients used in the standard calculation are provided in Table III.1.

CO<sub>2</sub> emissions of the target building [kg-CO<sub>2</sub>/yr]

=  $\sum$  (Primary energy consumption of the target building [MJ/yr]

x Component ratio of the primary energy of energy type i in the target building

x CO<sub>2</sub> emissions coefficients of energy type i [kg-CO<sub>2</sub>/MJ])

Table III.1 CO<sub>2</sub> emissions coefficients by energy type used in the assessment

Type	CO <sub>2</sub> emissions coefficients	Note
Electricity	*	kg-CO <sub>2</sub> /MJ * A value selected by the assessor (kg-CO <sub>2</sub> /kWh) which is calculated at 9.76MJ/kWh (2013 all-day average conversion factor of Energy Conservation Law)
City gas	0.0499	kg-CO <sub>2</sub> /MJ
Kerosene	0.0678	kg-CO <sub>2</sub> /MJ
A Heavy oil	0.0693	kg-CO <sub>2</sub> /MJ
LPG	0.0590	kg-CO <sub>2</sub> /MJ Used for residential purposes in the standard calculation
Others	0.0686	kg-CO <sub>2</sub> /MJ (Average of kerosene + A heavy oil)

## (2) Calculation of CO<sub>2</sub> emissions using on-site method

As of the 2010 edition, the assessment results of LCCO<sub>2</sub> when using the renewable energy and other types of energy on the premises as the on-site method, are displayed separately from efforts made in the main part of the building, such as eco-materials, long life buildings and energy saving. Buildings, such as detached houses where activities requiring a large energy consumption rarely occur, may be able to achieve a significant energy saving and CO<sub>2</sub> reduction at the operational phase, if only a photovoltaic power system is installed. However, adopting other energy-saving and CO<sub>2</sub> reduction methods is also important. Hence, considering these separately is considered necessary in order to express the effect of each. While buildings subject to CASBEE for Building (New Construction) are unlikely to have this problem, utilization of renewable energy for buildings is expected to increase in the future. Consequently, CASBEE for Building (New Construction) has begun to adopting this method as of the 2010 edition.

Currently, in order to promote the photovoltaic power generation, surplus electricity generated by the photovoltaic power system, which is not consumed within the building, may be sold to energy companies. A system, in which energy companies buy the surplus electricity at a higher price than a unit selling price, is also applied. In the buying and selling of electricity, the environmental value (the CO<sub>2</sub> reduction effect) added by the photovoltaic power generation is also included. From this viewpoint, the CO<sub>2</sub> reduction effect by the surplus electricity generated by a photovoltaic power system which is sold to energy companies cannot be included in the environmental assessment of the target building.

On the other hand, even if the surplus electricity is sold along with the environmental value, if the physical performance of a building (or a site) which has solar panels installed can show a contribution to CO<sub>2</sub> reduction in Japan, it will promote photovoltaic power generation in Japan. In the CASBEE assessment, this is considered important in order to establish a low-carbon society. Accordingly, the CO<sub>2</sub> reduction effect of the electricity generated by a photovoltaic power system, which is sold to another entity is added to the calculation in the on-site method. In this regard, however, the amount sold to others through the Feed-in Tariff system is excluded from the assessment. Regarding the environmental value of the electricity generated by a photovoltaic power system, various systems are currently being discussed by the central and prefectural governments. It should be noted that this method may be subject to review according to progress in the development of these systems in the future.

## (3) Calculation of CO<sub>2</sub> emissions using the off-site method

As part of the countermeasures for global warming, the Renewable Energy Certificates and the Carbon Offset method, in which carbon credits are obtained, are promoted. These methods may not always focus on the environmental performance of the building itself, but they are effective in terms of the national effort against global warming, and therefore, should be promoted. From the CASBEE 2010 edition, these efforts made outside the premises were classified as off-site methods, which were added to the assessment of LCCO<sub>2</sub>.

Specifically, the following actions are evaluated as off-site methods.

- [1] The following efforts made by the building owner and users
- Renewable Energy Certificates and Renewable Heat Certificates
  - Kyoto Credit
  - J-Credit System, etc.
- [2] Efforts regarding carbon offsets made by energy suppliers

Regarding efforts by building owners or users, the purchase of credits, etc., or to promise to buy them, is required in the assessment by CASBEE for Building (Existing Building) valid for three years after the completion of construction.

Regarding the effect of "[2] Efforts regarding carbon offsets made by energy suppliers," the assessment can be carried out, for example, by obtaining the product of the difference between the latest measured emissions coefficients\*<sup>1</sup> at the time of assessment and the adjusted emissions coefficients\*<sup>2</sup>, and the amount of electricity bought from the energy supplier. (see Figure III.2)

\*1 Based on the provisions of Article 2, paragraph 4 of the Ministerial Ordinance (MOE, etc.) regarding the calculation of GHG emissions resulting from business activities of specified emitters

\*2 Based on the provisions of Article 20, paragraph 2 of the order on reporting the appropriate calculation of carbon dioxide equivalent GHG emissions and sinks (MOE, etc.)

\*3 Government-certified emission coefficients (measured and adjusted) and substitute values by electric power supplier are published every year. Confirm any updates of the CASBEE assessment manual and software. In cases where the assessment manual and software do not support the updates, the latest values are available on the website of MOE.

Table III.2 Measured CO<sub>2</sub> emissions coefficients and adjusted CO<sub>2</sub> emissions coefficients by an electric power supplier

General PPS	Actual emissions coefficient (t-CO <sub>2</sub> /kWh)	Adjusted emission coefficient (t-CO <sub>2</sub> /kWh)	Specified PPS	Actual emissions coefficient (t-CO <sub>2</sub> /kWh)	Adjusted emission coefficient (t-CO <sub>2</sub> /kWh)	Specified PPS	Actual emissions coefficient (t-CO <sub>2</sub> /kWh)	Adjusted emission coefficient (t-CO <sub>2</sub> /kWh)
Hokkaido Electric Power Co., Inc.	0.000688	0.000680	eREX Co., Ltd.	0.000603	0.000428	Showa Shell Sekiyu K.K.	0.000367	0.000364
Tohoku Electric Power Co., Inc.	0.000600	0.000560	Idemitsu Green Power Co., Ltd.	0.000086	0.000106	Nippon Steel & Sumikin Engineering Co., Ltd.	0.000655	0.000654
Tokyo Electric Power Co., Ltd.	0.000525	0.000406	Itochu Enex Co., Ltd.	0.000676	0.000293	Senboku Natural Gas Power Generation Co., Ltd.	0.000388	0.000385
Chubu Electric Power Co., Inc.	0.000516	0.000373	Eneserve Corp.	0.000616	0.000482	Diamond Power Corp.	0.000431	0.000427
Hokuriku Electric Power Company	0.000663	0.000494	Ebara Environmental Plant Co., Ltd.	0.000456	0.000456	Tess Engineering Co.,Ltd.	0.000494	0.000490
Kansai Electric Power Co., Inc.	0.000514	0.000475	Oji Paper Co., Ltd.	0.000475	0.000471	Tokyo Eco Service Co., Ltd.	0.000092	0.000091
Chugoku Electric Power Co., Inc.	0.000738	0.000672	ORIX Corp.	0.000762	0.000757	Nihon Techno Co., Ltd.	0.000508	0.000509
Shikoku Electric Power Co., Inc.	0.000700	0.000656	e-sell Co.,Ltd.	0.000000	0.000000	Japan Logistic Coop.	0.000486	0.000256
Kyushu Electric Power Co. Inc.	0.000612	0.000599	Ennet Corp.	0.000429	0.000427	Panasonic Corp.	0.000498	0.000492
Okinawa Electric Power Co., Inc.	0.000903	0.000692	F-Power Co., Ltd.	0.000525	0.000445	Premium Green Power Corp.	0.000018	0.000022
			G-Power Co., Ltd.	0.000441	0.000000	Marubeni Corp.	0.000378	0.000324
			Nihon Ceremony Corp.	0.000797	0.000789	Mitsuuroko Green Energy Co., Ltd.	0.000366	0.000445
			Summit Energy Corp.	0.000438	0.000259	Les Power Co.,Ltd.	0.000420	0.000000
			JX Nippon Oil & Energy Corp.	0.000367	0.000364			
			JEN Holdings Co., Ltd.	0.000494	0.000490			
			Shigakogen Resort Kaihatsu Corp.	0.000312	0.000309			
Alternative value	0.000550 (t-CO <sub>2</sub> /kWh)							

(2012 actual data published on December 19, 2013)

## 2. Primary energy equivalent (Ministerial Notification No. 1 of METI/MLIT, 2013)

The following values are used to convert the amount of energy into the amount of heat (primary energy equivalent) according to Evaluation Standards for Clients and Owners of Specified Buildings Concerning Rational Use of Energy in Housing (Ministerial Notification No. 1 of METI/MLIT, 2013).

Table IV.3 Primary Energy Equivalent

Heavy oil	41,000 kJ/l
Kerosene	37,000 kJ/l
Liquefied petroleum gas	50,000 kJ/kg
City gas	45,000 kJ/m <sup>3</sup>
Heat supplied by other entities (steam, hot water, and cold water)	1.36 kJ/kJ (applicable when appropriate to convert the amount of energy into the amount of heat using sources supplied by other entities)
Electricity	9,760 kJ/kWh (the amount of electric power consumption when purchasing daytime power was 9,970 kJ/kWh, and the amount of electric power consumption when purchasing nighttime power was 9,280 kJ/kWh)  Nighttime power purchased means the supply of electric power by a general electric utility as stipulated in Paragraph 2 of Section 1 of Article 2 of the Electricity Enterprises Law (Law No. 170, 1964) from 22:00 until 8:00 the following day. Daytime power purchased means the supply of electric power by a general electric utility as stipulated in the same paragraph from 8:00 until 22:00.

<sup>6</sup>Source: Attached Table 6 of the Evaluation Standards for Clients and Owners of Specified Buildings Concerning Rational Use of Energy in Housing (Ministerial Notification No. 1 of METI/MLIT, 2013)

## Afterword

This manual is part of the activity achievements by CASBEE Board of the Stakeholders (chaired by Shuzo Murakami) under Japan Sustainable Building Consortium (JSBC) and Sub-committee on CASBEE Property Assessment Review. We would like to extend our sincere appreciation to all those who provided their cooperation.

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**CASBEE for Market Promotion**

● Assessment Manual (2014 Edition) [For Offices and Retails]

Not for Sale

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Issued on	February 20, 2015
Editorial Assistance	Japan Sustainable Building Consortium (JSBC)
Published by	Institute for Building Environment and Energy Conservation (IBEC) Zenkyouren Building Kojimachi-kan, 3-5-1 Kojimachi, Chiyoda-ku, Tokyo 102-0083 Japan TEL: +81-3-3222-6723      FAX: +81-3-3222-6696 Email: casbee-info@ibec.or.jp      URL: <a href="http://www.ibec.or.jp/CASBEE/">http://www.ibec.or.jp/CASBEE/</a>
Printed by	Rengo Printing Center Co., Ltd.

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# CASBEE<sup>®</sup> for Market Promotion ● Technical Manual (2014 Edition)

Editorial Assistance : Japan Sustainable Building Consortium (JSBC)

Published by : Institute for Building Environment and Energy Conservation (IBEC)