Ecology Guideline

For the

ICT Industry

(Version 2)

(Draft)

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ICT Ecology Guideline Council

Ecology Guideline Contents

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1. Background and Purpose

1.1 Background

In the face of global warming, Japan must take responsible action to reduce CO_2 emissions and the info-communications technology (ICT) industry needs to further strengthen its own voluntary efforts currently in effect.

As mentioned in the April 2008 Report Released by the "Study Group on ICT Policy for Addressing Global Warming (Ministry of Internal Affairs and Communications: MIC)," the use of ICT can dramatically increase efficiency in production, consumption and industrial activities and greatly contribute to the reduction of carbon emissions by replacing physical travel and easing traffic congestion. However, the growth in the scale of ICT services which are realized through configuring network equipment, servers, and other devices, and the resulting traffic volume have led to increased consumption of energy (electricity), translating into escalating CO_2 emissions.

To address this increase in CO_2 emissions, the MIC report released in June 2009 by its "Study Group on Ecological Measures in the Info-communications Industry" listed (i) the procurement of energy-efficient equipment by telecommunications services providers and (ii) making reductions in CO_2 emissions by telecommunications services providers more visible - as two of the numerous effective measures in decreasing CO_2 emissions. It also sought the creation of a guideline by ICT associations with the cooperation of equipment vendors and other relevant entities, covering such topics as "assessment of CO_2 emissions by equipment," "labeling" and "Eco ICT Logo."

With the release of this MIC report, the five industry organizations: Telecommunications Carriers Association (TCA), Telecom Services Association (TELESA), Japan Internet Providers Association (JAIPA), Communications and Information network Association of Japan (CIAJ) and ASP-SaaS Industry Consortium (ASPIC) created the "ICT Ecology Guideline Council," (hereafter referred to as "Council") on June 26, 2009 to contribute to decreasing CO_2 emissions through the cooperative efforts to lower energy-consumption among ICT equipment users – including telecommunications services providers - and manufacturers. The mission of the Council is to (1) determine an "assessment standard" for use in energy-efficient "procurement standards" of equipment and data center services by telecommunications services providers and (2) create a guideline for "establishing procurement standards" and a "self-assessment of actions" to indicate appropriate CO_2 reduction measures taken by individual telecommunications services providers.

1.2 Purpose

Curbing power consumption by the equipment used to provide services is an effective way for telecommunications services providers to reduce CO_2 emissions. To

that end, it is appropriate for individual telecommunications services providers to establish "procurement standards" for buying telecommunications equipment and services that emit lower amounts of CO_2.

Furthermore, telecommunications services providers need to endeavor to increase energy efficiency across the entire business spectrum. To further promote ecology-conscious actions by telecommunications services providers, individual companies need clear normative actions, and there needs to be a framework that simplifies assessment by a third-party.

In consideration of these factors, this Guideline sets forth points 1) and 2) below and by doing so, seeks to enhance ecology-conscious actions, such as efforts to reduce CO_2 emissions by telecommunications services providers. This Guideline also aims to promote ecology-consciousness among non-telecommunications services providers who use ICT equipment.

(1) Guideline to establish procurement standards of energy-saving equipment

Indicate an "assessment standard" to assist the formulation of "procurement standards" by telecommunications services providers for equipment and services with a focus on the reduction of CO_2 emissions.

(2) Guideline for disclosing self-assessment of ecology-conscious actions

Prepare a framework for public disclosure that facilitates an understanding of the status of efforts to reduce CO_2 emissions, in order to show that telecommunications services providers are appropriately making such efforts. To that end, the Council will provide a Self-Assessment Checklist and "Eco ICT Logo."

Furthermore, this guideline is a reference for telecommunications services providers in establishing voluntary procurement standards. It is possible that equipment deemed necessary by telecommunications services providers due to performance and functional requirements do not meet the energy-saving standards of this guideline.

2. Definitions

2.1 Definitions of Major Guideline Terminologies

(1) Telecommunications services providers

Under this Guideline, an entity providing telecommunication services based on the Telecommunications Business Act is referred to as a telecommunications services provider. Moreover, the term is not limited to entities belonging to an industry organization.

(2) Vendor

Under this Guideline, "vendors" refer to all equipment manufacturers (including OEM businesses) but does not include businesses dealing solely in sales and distribution.

(3) Eco ICT Logo

A symbol for broadly disseminating to the public that self-assessment of CO_2 emission reducing and other ecologically conscious activities are being performed.

(4) Figure of merit

An index used to calculate the energy-saving effects of a device or data center.

(5) Assessment result

A result of assessment based on actual measurement.

(6) Normative reference

An assessment standard (expressed as an assessment scale) for determining the energy-saving effect.

(7) Assessment scale

An assessment scale of five ranks representing rate of reduction in energy consumption vs. the normative reference shall be used to facilitate the understanding of the energy efficiency of devices or data centers. Ranks are indicated by the number of stars (★). The greater the number of stars, the greater the energy efficiency.

(8) Self-assessment checklist

A table of assessment items established by the Council to be used for self-assessment and public disclosure of ecology-conscious actions.

(9) Assessment standard based on the Top Runner Program

Target reference values for energy conservation set forth under the Act on the Rational Use of Energy (hereinafter referred as the Energy Conservation Law).

3 Relative Positioning and Expected Impact

3.1 Scope

This guideline basically applies to telecommunications services providers but also considers serving as a reference for companies outside the scope of telecommunications services providers that are planning "procurement standards" or are engaged in broader efforts to reduce CO_2 emissions.

The scope of who the assessment result information in this Guideline shall be made available to will broaden in phases. In Step 1, the information shall be provided to those who are procuring mainly ICT equipment. In Step 2, the information shall be made available with no restrictions, in order to promote ecology-consciousness among all users of ICT equipment.

In addition, the "Eco ICT Logo" shall be used not only by a person who operates a telecommunications business defined under the Telecommunications Business Act, but may be used by a person who operates a business related to telecommunications services using substantial ICT equipment.

3.2 Policy

As stated in 1.2 Purpose, the policy of this Guideline is to (1) lay down guidelines for establishing a procurement standard of energy-saving equipment among telecommunications services providers and (2) lay down guidelines for self-assessment and disclosing ecology-conscious actions.

As for (1), laying down guidelines for establishing procurement standards of energy-saving equipment among telecommunication carriers, this Guideline sets forth:

- categories, relevant equipment and assessment standards that can be shared amongst the vendors and companies making the procurement; and
- directions for easy-to-understand notations to be used by those involved in procurement.

As for (2), laying guidelines for self-assessment and disclosing ecology-conscious actions, this Guideline proposes:

- a method of public disclosure using self-assessment checklists and "Eco ICT Logo."

3.3 Expectations for Respective Parties

By creating this Guideline, we expect the respective parties to take the following actions:

(1) Telecommunications services providers

[1] Establishment of Procurement Standards

Referring to the figure of merit and assessment standards provided in this Guideline for equipment and data centers, telecommunications services providers shall formulate their own procurement standards incorporating market trends and their respective business circumstances while allowing for safety and reliability considerations.

<*Image for use as reference*>

Company ABC's Procurement Standard (executed in FYxx)

In procuring materials, we at our company have clearly defined our stance to contribute to the creation of a sound material-cycle society and have established a procurement standard to further promote this effort.

1. Scope of equipment covered: ICT equipment and services
2. Procurement standard

For equipment listed in the "Ecology Guideline for ICT Industry," procurement decisions shall basically be made from among equipment with energy-saving ranking of *n* stars or above.

For equipment not listed in the Guideline, the equipment with the lowest possible electric power consumption shall be procured.

<*Image for use as reference*>

Company ABC's Procurement Standard (executed in FYxx)

In procuring materials, we at our company have clearly defined our stance to contribute to the creation of a sound material-cycle society and have established a procurement standard to further promote this effort.

Scope of equipment covered, procurement standard

For the following equipment listed in the "Ecology Guideline for ICT Industry," procurement decisions shall basically be made from among equipment with energy-saving ranking stars [ ] or above listed to the right of the Equipment Type below. For equipment not listed in the Guideline, the equipment with the lowest possible electric power consumption shall be procured.

Equipment A: *n* stars or above
Equipment B: *n* stars or above

[2] Indication of the "Eco ICT Logo"

Check the status of efforts and achievements in reducing CO_2 emissions and disclose those results using an "Eco ICT Logo," to show that telecommunications services providers are appropriately engaged in efforts to reduce CO_2 emissions.

(2) Vendors

[1] Indication of equipment assessment outcome

Vendors wishing to submit their product to the Council as energy-saving equipment covered by the scope of this Guideline must measure and evaluate the

device in accordance to section 5.2 of this Guideline and submit the assessment outcome (assessment results and assessment scale ranking) to the Council so that the information can be publicly disclosed on the Council homepage.

(3) Data center operators

[1] Public disclosure of data

In relation to data center services, data center operators shall publicly disclose data relevant to energy-saving (such as PUE values, with measurement conditions) which would serve as a reference for procurement by telecommunications services providers.

3.4 Expected Impact

The relevant equipment and assessment standards indicated in this Guideline allow for the establishment of categories and assessment standards that can be shared by both vendors and the companies making the procurement, which benefits both sides to the extent it can eliminate inconsistencies in manufacturing and procurement. Furthermore, it is expected that as telecommunications services providers add energy-saving items to their procurement standards and actively install energy efficient equipment, this, in turn, will promote the development of energy efficient ICT equipment.

By formulating an assessment standard with the objective of saving energy, it is hoped that standardization bodies will accelerate deliberations of low power-consuming technologies (such as technologies to control stand-by power of access equipment).

3.5 Revisions

This guideline will require appropriate response to: changes in policy relating to global warming measures; the status of ICT service provision; penetration of equipment and the like; and technological advances. To that end, even after its establishment, this Guideline shall continue to be studied by the Council and:

- the scope of equipment covered shall be broadened, and
- review of the criteria, such as figure of merit and normative reference shall be made.

3.6 Notice of Disclaimer

This Guideline shall be used as reference by telecommunications services providers at their own discretion to determine standards for procuring ICT equipment or data centers. As for the "Eco ICT Logo," the telecommunications services provider shall be responsible for filling out the check list, making the information public and using the logo.

The Council shall not be liable for any damages and/or conflicts resulting from the use of this Guideline. It is presumed that the user of this Guideline shall be

responsible for any incidental or consequential damages and/or conflicts resulting from the use of this Guideline.

4. Outline of the Guideline

4.1 "Assessment standards" for equipment covered (for details, see 5.2)

(1) Equipment covered in this Guideline and relevant values

* An assessment scale is designated for each Equipment Type based on normative references (refer to the following table and/or section 5.2).

Equipment Type	Category	Equipment name	Figure of merit	Normative reference	Approximate date for achieving normative reference	Notes
Broadband router[1] (no VPN function)	A	Wired router	Power consumption (W)[8]	4	End of FY2010	X2: 2.4 GHz wireless output (mW/MHz) X5: 5 GHz wireless output (mW/MHz) *Figure of merit and normative reference shall be compliant with top runner assessment standards.
	B	VoIP Wired router		5.5		
	C	Wireless router (2.4 GHz)		0.10×X2+ 3.9		
		Wireless router (5 GHz)		0.15×X5+ 3.9		
		Wireless router (2.4 GHz + 5 GHz)		0.10×X2+ 0.15×X5+ 5.1		
	D	ADSL router		7.4		
	E	ADSL router w VoIP		7.4		
	F	wireless ADSL router		8.8		
Layer-2 switch (box type)[2]	A	Layer-2 switch (with SNMP management and IP filtering functions)	Power consumption (W)/ maximum effective transmission rate (Gbps)[9]	$(\alpha_n+P_n)/T$	End of FY2011	α_n: sum of power consumption of port and fixed power consumption P_n: additional power consumption of PoE T: maximum effective transmission rate n: Category (A, B, C, D) *Figure of merit and normative reference shall be compliant

	B	Layer-2 switch (with SNMP manage-ment function, w/o IP filtering function)				with top runner assessment standards.
	C	Layer-2 switch (with Web manage-ment function)				
	D	Layer-2 switch (w/o manage-ment function)				
Transport equipment[3]	WDM	DWDM device	Maximum throughput (Gbps)/avg power consump-tion (W) [10]	0.32	End of FY2012	Average power consumption = (power consumption at full wavelength + power consumption at +1 wavelength) / 2 *Figure of merit shall be compliant with ATIS references
		CWDM device		0.48		
PON equipment (OLT)[4]	GE-PON	OLT (AC power source)	Average power consump-tion(W)/ total number of lines[11]	0.46	End of FY2012	Average power consumption = (P100 + P50 + P0) / 3 Total number of lines = total number of IF ports X no. of PON branches
		OLT (DC power source)		0.42		
PON equipment (ONU)	GE-PON	ONU(100Mbps)	Average power consump-tion (W) [12]	3.68	End of FY2012	Average power consumption = (P100 + P50 + P0) / 3
		ONU(1Gbps)		4.45		

Broadband base station equipment[5]	WiMAX	WiMAX base station (integrated 10W device (1 system))	$\sum Pn/\{ Pidle \times (1-\alpha)+Pmax \times \alpha\}$[13]	12.60	End of FY2012	Pn: power transmission by antenna terminal n (W) Pidle: primary supply-side power when there is no load (W) Pmax: primary supply-side power at maximum transmission (W) α: average daily down link transmission traffic rate.

		WiMAX base station (integrated 10W device (2 systems))		9.63		
		WiMAX base station (integrated 5W device (1 system))		5.84		
	LTE	LTE base stations (segregated 20W device)		20.32	End of FY2013	
		LTE base stations (integrated 20W device)		13.77		
		LTE base stations (segregated 10W device)		6.91		
Power supply equipment[6]	External power source	AC adapter	Average conversion efficiency[14]	62.2+6.26ln(P_{no})	End of FY2011	Average conversion efficiency＝(η_{25}＋η_{50}＋η_{75}＋η_{100})/4 η_n: efficiency at n%load P_{no} : nameplate output (W) * Figure of merit shall be compliant with global efficiency agreements

	Rectifier	Single-phase AC100V input rectifier	Average conversion efficiency x 1,000[15]	862	April, 2012	Average conversion efficiency＝(η_{30}＋η_{40}＋η_{50}＋η_{60}＋η_{70}＋η_{80})/6 η_n: efficiency at n%load * Figure of merit shall be compliant with ATIS specs
		Single-phase AC200V input rectifier		878		
		3-phase AC200/400V input rectifier (output power<5kW)		891		
		3-phase AC200/400V input rectifier (output power≧5kW)		908		
Server equipment[7]	A	Dedicated CISC (n<32 I/O slots)	<<Figure of merit for active state>> Overall ssj_ops/watt=∑ssj_ops/∑ power consumption (W)/10[16] <<Figure of merit for idle state>> {(W_1+W_2)/2}/Q	TBD		The top line of each category indicates active state normative reference and approximate date for its achievement, while the bottom line indicates corresponding information for idle state. [Figure of merit for active state] ssj_ops: processing capacity *Figure of merit shall be compliant with SPECpower_ssj®2008 [Figure of merit for idle state] W_1: power consumption in idle state (W) W_2: power consumption in low-power mode (W) Q: compositetheoryl performance (unit: giga calculations) *Figure of merit and normative reference shall be compliant with top runner assessment standards.

				1,950	End of FY2011	
	B	Dedicated CISC (n≧32 I/O slots)		TBD		
				2,620	End of FY2011	
	C	RISC (n<8 I/O slots)		TBD		
				13	End of FY2011	
	D	RISC (8≦n<40 I/O slots)		TBD		
				31	End of FY2011	
	E	RISC (40≦n I/O slots)		TBD		
				140	End of FY2011	
	F	IA64 (n<10 I/O slots)		TBD		
				6.2	End of FY2011	
	G	IA64 (n≧10 I/O slots)		TBD		
				22	End of FY2011	
	H	IA32 (0 I/O slots)		1,000	End of FY2010	
				1.3	End of FY2011	
	I	IA32 (1≦n<7 I/O slots, n<2 CPU sockets)		1,000	End of FY2010	
				1.2	End of FY2011	
	J	IA32 (1≦n<7 I/O slots, 2≦n<4 CPU sockets)		1,000	End of FY2010	
				1.9	End of FY2011	
	K	IA32 (1≦n<7 I/O slots, n≧4 CPU sockets)		TBD		
				6.7	End of FY2011	
	L	IA32 (n≧7 I/O slots)		TBD		
				7.4	End of FY2011	
Storage equipment (subsystems)[17]	M	For mainframe servers[18]	Power consumption (W)/ Storage capacity (GB)[19]	E=exp (1.85 x In (N) - 18.8)	End of FY2011	N: no. of steady revolutions (unit: revolutions per minute) *Figure of merit and normative reference shall be compliant with top runner assessment standards.

	N	For use other than mainframe servers		E=exp (1.56 x In (N) - 17.7)		

[1] Broadband router
Routers which relay data using International Organization for Standardization (ISO) OSI (Open System Interconnection) layer 3 (network layer) using IP addresses included in the destination information of packets, and with an effective transmission rate of no more than 200 Mbps (no more than 100 Mbps for wireless routers).

[2] Layer 2 (L2) switch
Equipment which relays data on the network using International Organization for Standardization (ISO) OSI (Open System Interconnection) layer 2 (data link layer).

[3] Transport equipment
Equipment whose main task is to relay data on the network using International Organization for Standardization (ISO) OSI (Open System Interconnection) layer 1 (physical layer). This category includes WDM equipment, electric multiplexers and FC switches.

[4] PON equipment
A name for a category of optical access devices for building PON (Passive Optical Network) systems, including GE-PON, G-PON and 10GE-PON equipment

[5] Broadband base station equipment
A generic term for a category of radio base station equipment such as WiMAX base station or LTE base station equipment.

[6] Power supply equipment
A device which provides electric power to the equipment and is physically separate and independent of the equipment.

[7] Server
A computer device comprising of a central processing unit (CPU), a main memory, an input/output control and a power source. It exists as part of a network to provide information and services to other computer devices. It is designed to use an operating system (OS) so that it can be installed with and run user applications.

[8] The power consumed at maximum effective transmission rate. The smaller the number, the greater the energy efficiency.

[9] The power consumed at maximum effective transmission rate. The smaller the number, the greater the energy efficiency.

[10] Maximum throughput at average power consumption (average power consumption of full wave length and 1 wave length). The greater the number, the greater the energy efficiency.

[11] Average power consumption (average power consumption at loads of 100%, 50% and 0%) per line. The smaller the number, the greater the energy efficiency.

[12] Average power consumption (average power consumption at loads of 100%, 50% and 0%). The smaller the number, the greater the energy efficiency.

[13] Transmission power (total per antenna) at average input power (average input power at loads of 100% and 0% when applying daily traffic rates). The greater the number, the greater the energy efficiency.

[14] Average conversion efficiency at loads of 100%, 75%, 50% and 25%. The greater the number, the greater the energy efficiency.

[15] Average conversion efficiency at loads of 80%, 70%, 60%, 50%, 40% and 30%. The greater the number, the greater the energy efficiency.

[16] Total power consumption at CPU loads of 0 through 100% vs. total processing capacity. The greater the number, the greater the energy efficiency.

[17] A subsystem refers to 1 unit containing multiple disk drives, magnetic disk control unit, and magnetic disk device (for machines using only the magnetic disk control unit within the computer, 1 unit refers to a chassis with an assigned model number/name).

[18] "Mainframe servers" refers to server-type computers (computers designed to provide services via networks) with dedicated CISC (of CPUs designed to implement multiple commands of differing bit counts, those designed for individual computers) and the subsystem connected to the server is referred to as mainframe server use.

[19] Power consumption per 1GB. The smaller the number, the greater the energy efficiency.

(2) Assessment scale for relevant equipment

[1] Broadband router (no VPN function)

Figure of merit: Energy efficiency ratio En=power consumption (W)

NR=normative reference

Assessment scale	Rate of reduction vs. power consumption at NR	Energy efficiency ratio per category En (W)						Notes
		A	B	C	D	E	F	Normative reference E (W) per table under 5.2.1.1 (3) Normative References
★★★★★	n≧30%	En≦E×0.7						
★★★★	20%≦n＜30%	E×0.7<En≦E×0.8						
★★★	10%≦n＜20%	E×0.8<En≦E×0.9						
★★ (includes NR)	0%≦n＜10%	E×0.9<En≦E						
★	(Normative reference not achieved)	En>E						

[2] Layer-2 switch (box type)

Figure of merit: Energy efficiency ratio En=energy consumption (W)/ maximum effective transmission rate (Gbps)

NR=normative reference

Assessment scale	Rate of reduction vs. power consumption at NR	Energy efficiency ratio per category En (W)				Notes
		A	B	C	D	Normative Reference E (W/Gbps) per table under 5.2.2.1 (3) Normative References
★★★★★	n≧30%	En≦E×0.7				
★★★★	20%≦n＜30%	E×0.7<En≦E×0.8				
★★★	10%≦n＜20%	E×0.8<En≦E×0.9				
★★ (includes NR)	0%≦n＜10%	E×0.9<En≦E				
★	(Normative reference not achieved)	En>E				

Note: Rate of reduction of power consumption vs. NR shall be comparable for equipment with similar maximum effective transmission rates.

[3] WDM

Figure of merit: TEER= maximum throughput (Gbps)/ average power consumption (W)

NR=normative reference

Assessment scale	Rate of reduction vs. power consumption at	Average power consumption for	Average power consumption for

	NR	800GbpsDWDM	40GbpsCWDM
★★★★★	n≧30%	P≦1,750	P≦58.4
★★★★	20%≦n＜30%	1,750＜P≦2,000	58.4＜P≦66.7
★★★	10%≦n＜20%	2,000＜P≦2,250	66.7＜P≦75.0
★★ (includes NR)	0%≦n＜10%	2,250＜P≦2,500	75.0＜P≦83.3
★	(Normative reference not achieved)	P＞2500	P＞83.3

Note: TEER (Telecommunications Energy Efficiency Ratio)

[4] GE-PON

OLT figure of merit: E= average energy consumption (W)/ total no. of lines
ONU figure of merit: P= average energy consumption (W)
NR=normative reference

Assessment scale	Rate of reduction vs. power consumption at NR	Average power consumption for OLT (AC power source) (W)	Average power consumption for OLT (DC power source) (W)
★★★★★	n≧30%	E≦0.322	E≦0.294
★★★★	20%≦n＜30%	0.322＜E≦0.368	0.294＜E≦0.336
★★★	10%≦n＜20%	0.368＜E≦0.414	0.336＜E≦0.378
★★ (includes NR)	0%≦n＜10%	0.414＜E≦0.46	0.378＜E≦0.42
★	(Normative reference not achieved)	E＞0.46	E＞0.42

Assessment scale	Rate of reduction vs. power consumption at NR	Average power consumption for ONU (100 Mbps)	Average power consumption for ONU (1 Gbps)
★★★★★	n≧30%	P≦2.576	P≦3.115
★★★★	20%≦n＜30%	2.576＜P≦2.944	3.115＜P≦3.56
★★★	10%≦n＜20%	2.944＜P≦3.312	3.56＜P≦4.005
★★ (includes NR)	0%≦n＜10%	3.312＜P≦3.68	4.005＜P≦4.45
★	(Normative reference not achieved)	P＞3.68	P＞4.45

[5] WiMax base station equipment

Figure of merit: E= total transmission power (W)/average primary input power (W)

Assessment scale	Rate of reduction vs. power consumption at NR	Reference average power consumption (W) for integrated 10W equipment (single) (Note 1)	Reference average power consumption (W) for integrated 10W equipment (dual) (Note 1)
★★★★★	n≧30%	P≦111.09	P≦145.39

★★★★	20%≦n＜30%	111.09＜P≦126.96	145.39＜P≦166.16
★★★	10%≦n＜20%	126.96＜P≦142.83	166.16＜P≦186.93
★★ (includes NR)	0%≦n＜10%	142.83＜P≦158.7	186.93＜P≦207.7
★	(Normative reference not achieved)	P＞158.7	P＞207.7

Assessment scale	Rate of reduction vs. power consumption at NR	Reference average power consumption (W) for integrated 5W equipment (single) (W) (Note 2)	
★★★★★	n≧30%	P≦119.86	
★★★★	20%≦n＜30%	119.86＜P≦136.99	
★★★	10%≦n＜20%	136.99＜P≦154.11	
★★ (includes NR)	0%≦n＜10%	154.11＜P≦171.2	
★	(Normative reference not achieved)	P＞171.2	

Notes
1: When transmission output is 10.0 W X 2
2: When transmission output is 5.0 W X 2

[6] LTE Base Station Equipment

Figure of merit: E=total transmission output (W)/average primary input power

Assessment scale	Rate of reduction vs. power consumption at NR	Average power consumption normative reference (W) for segregated 20W equipment (Note 1)	Average power consumption normative reference (W) for integrated 20W equipment (Note 1)
★★★★★	n≧30%	P≦413.38	P≦610.02
★★★★	20%≦n＜30%	413.38<P≦472.44	610.02<P≦697.16
★★★	10%≦n＜20%	472.44<P≦531.49	697.16<P≦784.31
★★ (includes NR)	0%≦n＜10%	531.49<P≦590.55	784.31<P≦871.46
★	Normative reference not achieved	P>590.55	P>871.46

Assessment scale	Rate of reduction vs. power consumption at NR	Average power consumption normative reference (W) for segregated 10W equipment (Note 2)	
★★★★★	n≧30%	P≦607.81	

★★★★	20%≦n＜30%	607.81<P≦694.64	
★★★	10%≦n＜20%	694.64<P≦781.47	
★★ (includes NR)	0%≦n＜10%	781.47<P≦868.31	
★	Normative reference not achieved	P>868.31	

Notes
1: When transmission output is 20 W × 2
2: When transmission output is 10 W × 2

[7] External Power Source

Figure of merit: Average conversion efficiency $\eta=(\eta_{25}+\eta_{50}+\eta_{75}+\eta_{100})/4$

P_{no} : nameplate output (W)

Assessment scale	Rate of reduction vs. power consumption at NR	Average conversion efficiency η (See formula (＊))
★★★★★	n≧30%	$\eta \geqq 70.7+5.00\ln(P_{no})$
★★★★	20%≦n＜30%	$67.7+5.46\ln(P_{no}) \leqq \eta < 70.7+5.00\ln(P_{no})$
★★★	10%≦n＜20%	$64.8+5.88\ln(P_{no}) \leqq \eta < 67.7+5.46\ln(P_{no})$
★★ (includes NR)	0%≦n＜10%	$62.2+6.26\ln(P_{no}) \leqq \eta < 64.8+5.88\ln(P_{no})$
★	(Normative reference not achieved)	$\eta < 62.2+6.26\ln(P_{no})$

(Note) P_{no}: Nameplate output power (W)

[8] Rectifier

Figure of merit: TEER=$(\eta_{30}+\eta_{40}+\eta_{50}+\eta_{60}+\eta_{70}+\eta_{80})/6$ x 1,000

Single-phase AC100V input rectifier

Assessment scale	Rate of reduction vs. power consumption at NR	Figure of merit(TEER)
★★★★★	n≧45%	TEER≧919
★★★★	30%≦n＜45%	900≦TEER＜919
★★★	15%≦n＜30%	881≦TEER＜900
★★ (includes NR)	0%≦n＜15%	862≦TEER＜881
★	Normative reference not achieved	TEER＜862

Single-phase AC200V input rectifier

Assessment scale	Rate of reduction vs. power consumption at NR	Figure of merit(TEER)
★★★★★	n≧45%	TEER≧929
★★★★	30%≦n＜45%	911≦TEER＜929

★★★	15%≦n＜30%	894≦TEER＜911
★★ （includes NR）	0%≦n＜15%	878≦TEER＜894
★	Normative reference not achieved	TEER＜878

Three-phase AC200V/400V input rectifier (output power capacity of less than 5kW)

Assessment Scale	Rate of reduction vs. power consumption at NR	Figure of Merit（TEER）
★★★★★	n≧30%	TEER≧921
★★★★	20%≦n＜30%	911≦TEER＜921
★★★	10%≦n＜20%	901≦TEER＜911
★★ （includes NR）	0%≦n＜10%	891≦TEER＜901
★	Normative reference not achieved	TEER＜891

Three-phase AC200V/400V input rectifier (output power capacity of 5kW or more)

Assessment scale	Rate of reduction vs. power consumption at NR	Figure of merit（TEER）
★★★★★	n≧30%	TEER≧934
★★★★	20%≦n＜30%	925≦TEER＜934
★★★	10%≦n＜20%	916≦TEER＜925
★★ （includes NR）	0%≦n＜10%	908≦TEER＜916
★	Normative reference not achieved	TEER＜908

[9] Servers

<< Assessment standard for active state>>

Figure of merit: E = overall ssj_ops/watt

= ∑ssj_ops/∑power consumption (W)

Assessment scale	Rate of reduction vs. power consumption at NR	Energy efficiency ratio E per category	
		H, I, J	A – G, K, L
★★★★★	n≧60%	E≧2,500	TBD
★★★★	40%≦n＜60%	1,666≦E＜2,500	
★★★	20%≦n＜40%	1,250≦E＜1,666	
★★ （includes NR）	0%≦n＜20%	1,000≦E＜1,250	
★	(Normative reference not achieved)	E＜1000	

(Note): Comparison of the rate of reduction against power consumption at normative reference among equipment with similar processing capacity (∑ssj_ops value).
(Note): TBD= To be determined

<< Assessment standard for idle state>>

Figure of merit: Energy efficiency ratio En=power consumption (W)/Composite theory performance (GTOPS)

Assessment Scale	Rate of reduction vs. power consumption at NR	Energy efficiency ratio per category En (W/GTOPS)	Notes
		All categories（A-L）	
★★★★★	n≧60%	En≦E×0.4	See Normative References Table 5.2.7.1 (7) for E (W/GTOPS) Normative References
★★★★	40%≦n＜60%	E×0.4<En≦E×0.6	
★★★	20%≦n＜40%	E×0.6<En≦E×0.8	
★★ （includes NR）	0%≦n＜20%	E×0.8<En≦E	
★	Normative reference not achieved	E<En	

[10]Storage Equipment

Figure of merit:

Energy efficiency ratio En= power consumption (W)/storage capacity (GB)

Assessment Scale	Rate of reduction vs. power consumption at NR	Energy consumption efficiency En	Notes
★★★★★	n≧60%	En≦E×0.4	Normative references E (W/GB) are based on the table under 5.2.8.1 (3) Normative References.
★★★★	40%≦n＜60%	E×0.4<En≦E×0.6	
★★★	20%≦n＜40%	E×0.6<En≦E×0.8	
★★ （includes NR）	0%≦n＜20%	E×0.8<En≦E	
★	Normative reference not achieved	E<En	

4.2 Effort and Assessment Criteria for the "Eco ICT Logo"
(for details, see 7.2)

<Mandatory items>

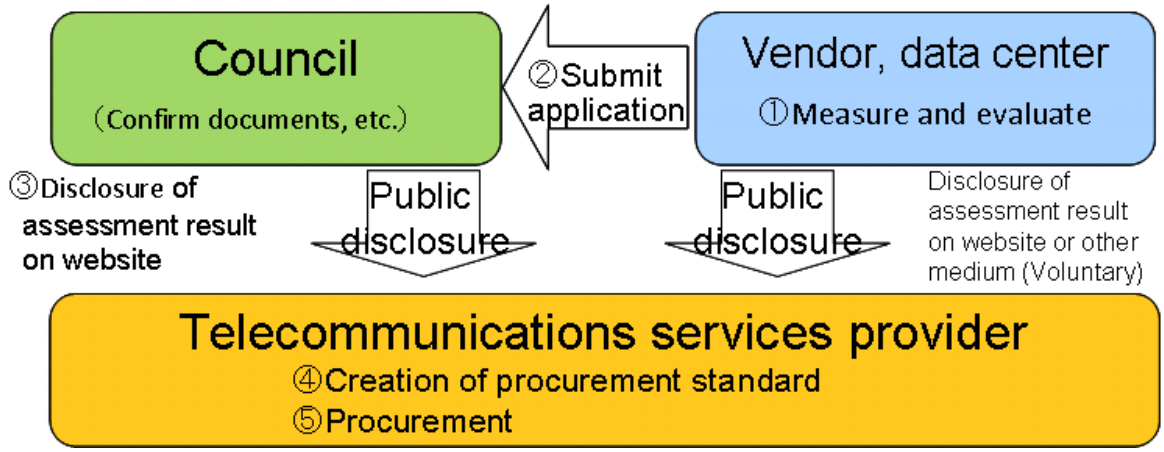
Type of effort		Assessment criteria
Preparation of a voluntary ecological action plan	1	Has a voluntary ecological action plan stipulating various efforts directed at reducing CO_2 emissions been created and is it being executed?
	2	Does the ecological policy include specific efforts stipulating numerical targets for the reduction of CO_2 emissions?
	3	Is the ecological policy documented and disseminated inside and outside of the company? Does the company carry out activities to inform and enlighten its employees? Is the company working to raise ecological awareness?
	4	Does the company disclose the individual activities listed in its voluntary ecological action plan along with implementation and achievement status to the general public?
Efforts relating to procurement	5	In regard to ICT equipment and data center services, has the company prepared a procurement standard that takes energy conservation into consideration? Is procurement carried out in accordance to the standard?
	6	Is the company cognizant of energy conservation in procuring office equipment, supplies and logistics (e.g., green purchasing)?
Promotion regime	7	In relation to efforts to reduce CO_2 emissions, has the company assigned a person or department responsible for such matters?
	8	Is there a regime in place using internal audits or other means to keep appropriate track of the implementation of measures and achievement of targets set forth in the voluntary ecological action plan?

<Recommended items>

Other ecological activities	9	Are ecologically-friendly efforts being made other than activities to save energy?
	10	Is the company involved in ecological preservation activities in collaboration with local communities?

4.3 Image of Guideline Implementation

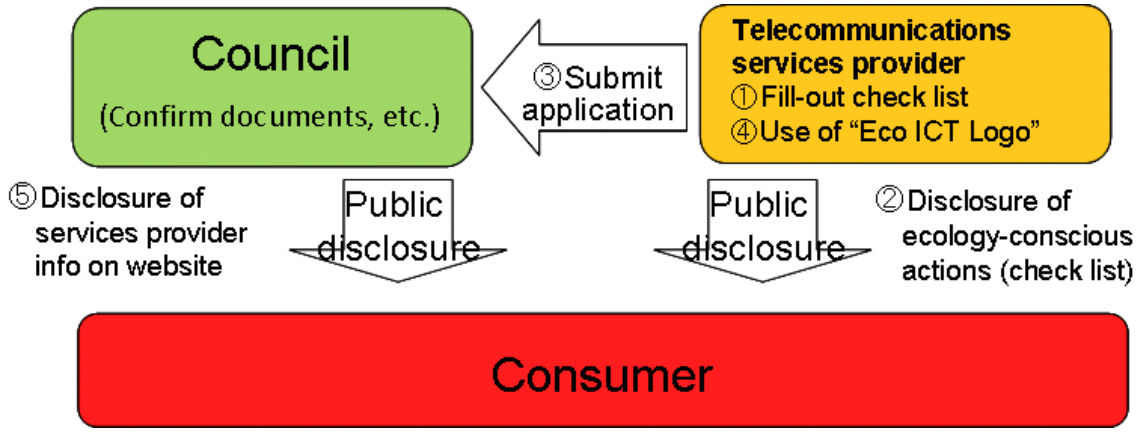
(1) Flow leading to public disclosure of assessment results by vendors and data center operators as well as how procurement by telecommunications services providers would proceed.



STEP 1: Assessment results shall be provided to telecommunications services providers, Council member companies, government offices, universities and research organizations.

STEP 2: Assessment results shall be made available to the general public.

(2) Flow of public disclosure of checklist and use of the "Eco ICT Logo" by telecommunications services providers.



Use of the "Eco ICT Logo" shall be limited to the following:

> Telecommunications services providers.

> A person who operates a telecommunications business defined under the Telecommunications Business Act, other than Telecommunications services providers.

> Neither of the above, but operating business related to telecommunications services using substantial ICT equipment AND recognized by the Council.

5. Assessment Standards

5.1 Assessment standards

5.1.1 Scope

The scope of ICT equipment covered in this Guideline shall be equipment used mainly by telecommunications services providers to provide their services, covering network equipment, power equipment, server equipment and storage equipment. The addition and/or elimination of equipment categorization and more detailed sub-categorizations shall be reviewed as deemed appropriate.

【Network equipment】

Equipment categorization	Category	Equipment covered	Notes
Upper-layer equipment	TBD	TBD	
Large-sized routers	TBD	TBD	
Broadband routers（with VNP functions）	TBD	TBD	
Broadband routers （without VNP functions）	A（WAN：Ether、LAN：Ether）	Wired router	Equipment classifications and sub-categories shall be aligned with top runner assessment standard
	B（WAN：Ether、LAN：VoIP）	Wired routers with VoIP	
	C（WAN：Ether、LAN：wireless）	Wireless routers	
	D（WAN：ADSL、LAN：Ether）	ADSL routers	
	E（WAN：ADSL、LAN：VoIP）	ADSL routers with VoIP	
	F（WAN：ADSL、LAN：wireless）	Wireless ADSL routers	
Layer-2 switch （chassis-type）	TBD	TBD	
Layer-2 switch（box-type）	A（with SNMP management and IP filtering functions）	Layer-2 switch	Equipment classifications and sub-categories shall be aligned with top runner assessment standard
	B（with SNMP management, w/o IP filtering functions）	Layer-2 switch	
	C（With web or other management functions）	Layer-2 switch	
	D（without management functions）	Layer-2 switch	
Transport equipment	WDM equipment	DWDM equipment	Equipment categorizations shall be aligned with ATIS
		CWDM equipment	Equipment

			categorizations shall be aligned with ATIS
PON equipment	GE-PON	OLT	
		ONU	
Broadband base station equipment	WiMAX	WiMAX base stations	
	LTE	LTE base stations	

【Power equipment】

Equipment categorization	Category	Equipment name	Notes
Power equipment	External power source	AC adapter	Excludes rechargers
	Rectifier equipment	Rectifier equipment	
	UPS	TBD	

【Server equipment】

Equipment categorization	Category	Equipment name	Notes
Server equipment	A	Dedicated CISC (n<32 I/O slots)	Equipment sub-categorizaties shall be aligned with top runner assessment standard
	B	Dedicated CISC (n≧32 I/O slots)	
	C	RISC (n<8 I/O slots)	
	D	RISC (8≦n<40 I/O slots)	
	E	RISC (40≦n I/O slots)	
	F	IA64 (n<10 I/O slots)	
	G	IA64 (n≧10 I/O slots)	
	H	IA32 (0 I/O slots)	
	I	IA32 (1≦n<7 I/O slots, n<2 CPU sockets)	
	J	IA32 (1≦n<7 I/O slots, 2≦n<4 CPU sockets)	
	K	IA32 (1≦n<7 I/O slots, n≧4 CPU sockets)	
	L	IA32 (n≧7 I/O slots)	

【Storage equipment】

Equipment categorization	Category	Equipment covered	Notes
Storage equipment (subsystems)	M	For mainframe servers	Equipment categorization and sub-categorizaties shall be aligned with top runner
	N	For use other than mainframe servers	

			assessment standard

Note: TBD=To be determined

5.1.2 Stance on other assessment standards

In regard to specific assessment standards for the equipment subject to this Guideline, in cases where appropriate standards covering practices by telecommunications services providers already existed, those existing standards were adopted. For equipment with no existing assessment standards, assessment standards for similar equipment were used as reference.

5.2 Equipment Definitions, Figures of Merit, Normative References and Measurement Methods

5.2.1 Routers

5.2.1.1. Broadband router

(1) Equipment Definition

Among routers which relay data on ISO's OSI (Open System Interconnection) layer 3 (network layer) using IP addresses included in the destination information of packets, routers with an effective transmission rate of no more than 200 Mbps (no more than 100 Mbps for wireless routers) and:

- having no VPN (Virtual Private Network) functions; and
- having no more than two phone lines if equipped with VoIP (Voice over Internet Protocol) functions.

The following is the definition of effective transmission rate.

Non-wireless: the sum of maximum down link and up link transmission rates (bps) including overhead (control information)

Wireless: down link transmission rate (bps) including overhead (control information)

Broadband routers as defined by the Energy Conservation Law

Equipment Definition of Energy Conservation Law

Equipment for sending and receiving electronic telecommunication signals having the function of transmitting electronic telecommunication signals to a path determined to be the most appropriate depending on the state of each path etc. from among available paths to reach the destination equipment (limited to those used almost exclusively for the Internet; when having a communication terminal equipment connect to the Internet through a phone line, excluding those used to connect to the Internet by calling an Internet service provider to have the said communication terminal equipment connect to the Internet, and others set forth under Ministerial Ordinance Number 39 from the Ministry of Economy, Trade and Industry[*1]).

*1: Exclusions provided under Ministerial Ordinance Number 39 from the Ministry of Economy, Trade and Industry are as follows.

[1] Those that do not transmit/exchange Internet protocol packets

[2] In transmitting Internet protocol packets, those with the maximum value of the sum of the number of signal bits of the said packets exceeding 200Mbps/s (excluding those specified in 6))
(Those having an effective transmission rate exceeding 200Mbit/s)

[3] Those that do not allow asynchronous transfer mode equipment to be easily removed.

[4] Those having the function of impressing high-frequency current of 10kHz or higher.

[5] Those having at least three of those used for sending and receiving sound among connection ports for sending and receiving electric telecommunications signals (excluding those using Internet protocol)

[6] In transmitting Internet protocol packets wirelessly, those with the maximum value of the sum of the number of signal bits of the said packets exceeding 100Mbit/s

[7] Those having the function to use satellites

[8] Those having the function of transmitting 53 or more subcarrier frequencies by using orthogonal frequency division multiplexing method.

[9] Those having the function of setting a Virtual Private Network.

[10] Those designed to be built into an electronic computer or other item.

(2) Figure of Merit

Adopt the assessment standard based on the top runner method (2009 Ministerial Notification No. 226 from the Ministry of Economy, Trade and Industry) for routing equipment specified in the Energy Conservation Law. Specific figures of merit are as follows.

Energy efficiency ratio E = Power consumption P (W)

(3) Normative References

[1] Method for determining normative references

Adopt the assessment standard based on the top runner method for routing equipment specified in the Energy Conservation Law.

[Normative References]

Specific normative references are as follows.

Category			Energy efficiency ratio E(W)
Type of interface on WAN side	Type of interface on LAN side	Category name	
Ethernet only	Ethernet only	A	4.0
	Ethernet with VoIP	B	5.5
	Ethernet with wireless function	C	When transmitting on wireless 2.4GHz band only: E = 0.10×X2＋3.9 When transmitting on wireless 5 GHz band only: E＝0.15×X5＋3.9 When transmitting the two frequencies mentioned above simultaneously: E＝0.10×X2＋0.15×X5＋5.1
ADSL only	Ethernet only	D	7.4
	Ethernet with VoIP	E	7.4
	Ethernet with wireless function	F	8.8

Notes

1: "WAN side" refers to the side of the port connected to a network such as the Internet. "LAN side" refers to the side of the port connected to other equipment.

2: E, X2 and X5 represent the following values:
E: Reference energy efficiency ratio (unit: W)
X2: 2.4 GHz wireless output (unit: mW/MHz)
X5: 5 GHz wireless output (unit: mW/MHz)

3: In Category C, for equipment capable of transmission by selecting 2.4 or 5 GHz wireless band, use the calculation formula for the frequency band with a higher effective transmission rate in (4) Measurement Methodology to calculate the value

for the reference energy efficiency ratio.

[Approximate Date for Achieving Normative References]

The end of Fiscal Year 2010 [adopted the target fiscal year per the reference on routing equipment (2009 Ministerial Notification No. 226 from the Ministry of Economy, Trade and Industry), specified in the Energy Conservation Law]

[2] Assessment scale references

The rate of reduction versus the normative reference shall determine the threshold. In the assessment scale, the rank covering the normative reference shall be ★★.

Assessment scale	Rate of reduction vs. power consumption at NR	Energy efficiency ratio per category En (W)						Notes
		A	B	C	D	E	F	NR E (W) per table under (3) [1] Normative References
★★★★★	n≧30%	En≦E×0.7						
★★★★	20%≦n＜30%	E×0.7<En≦E×0.8						
★★★	10%≦n＜20%	E×0.8<En≦E×0.9						
★★ (includes NR)	0%≦n＜10%	E×0.9<En≦E						
★	(Normative reference not achieved)	En>E						

(Note) In calculating energy efficiency ratio, calculate values to the first decimal place.

(4) Measurement Methodology

Measurement methods are as follows and coincide with those set forth under the 2009 Ministerial Notification Number 226 from the Ministry of Economy, Trade and Industry, which sets forth, among other things, assessment standards for vendors in relation to the stipulations of the Energy Conservation Law for routing equipment.

[1] To measure energy efficiency, measure power consumption at maximum effective transmission rate. Conditions for measuring power consumption and maximum effective transmission rate are as follows.

(a) The maximum value of the sum of the number of packets per second output to the WAN side and the number of packets per second output to the LAN side.

(b) A 1,500 byte packet shall be transmitted for measurement. However, if the transmission of a 1,500 byte packet is not possible, use the maximum packet length.

(c) Use IP packets for unicast transmission.

(d) The data pattern of the header section is arbitrary. Use 0 for all data

patterns of the packet to be measured.

(e) When measuring power consumption, it shall be acceptable to transmit the minimum packets suited to the maximum effective transmission rate of the router.

(f) Enable routing of packets received by the router. Routing is the relay of data to a destination determined by the IP address on a network using the layer 3 (network layer) of a model indicated in the Basic Reference Model 6 of Open Systems Interconnection stipulated in Japan Industrial Standard X5003. Upon performing the relay, the TTL value, which is the header information associated with an IP address, shall be deducted and relayed to a different data link.

(g) Removable components and functions that can be disabled without sacrificing the basic performance and functioning of the router shall be removed or disabled, respectively, for the measurement.

(h) Ports not involved in the measurement can be linked down.

(i) The peripheral temperature shall fall within the range of 16 to 32°C. However, for wireless routers the range shall be 0 to 40°C.

(j) Power voltage shall be within the range of ±10% of rated input voltage (100V or 200V).

(k) Use rated frequency for AC power source frequency.

(l) Conduct measurements with the router in a stationary state.

(m) For products using an AC power source, measure power consumption at the power plug.

(n) In the case of AC power, use effective power as power consumption.

[2] Use the following conditions for routers with wireless capacity

(a) Wireless transmission direction shall be from the WAN side to the LAN side.

(b) If there are multiple wireless LAN interfaces capable of operating simultaneously, operate them simultaneously.

(c) Use a configuration that disables functions such as data compression and output power adjustment.

(d) Use maximum link speed of the router.

(e) Take measurements on the tested equipment using packet generators.

(5) Assessment Result and Assessment Scale Ranking

[1] Assessment result

The assessment result shall be the figure of merit actually measured by the vendor according to 5.2.1.1(4) Measurement Methodology.

[2] Assessment scale ranking

The assessment scale ranking (★-★★★★★) shall be based on normative reference and assessment result.

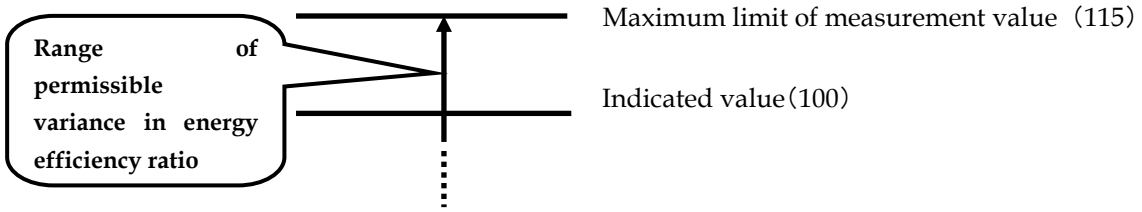
[3] Variance in assessment result

Values specified in 2009 Ministerial Notification No. 226 from the Ministry of Economy, Trade and Industry (2010 METI Notification No. 149 revised version) shall apply.

The specific range of permissible variance in assessment results shall be x/115 of the energy efficiency ratio of individual equipment, where x is a figure of 100 or more.

As indicated in the diagram below, this means that where the assessment result of the individual equipment is 100, the measurement value of the energy efficiency ratio (energy consumption (W)) cannot exceed 115.

In other words, the range of permissible variance of the indicated value is +15% or less.



5.2.2 Switching Equipment

5.2.2.1. Layer 2 (L2) Switches (box type)

(1) Equipment Definition

Among equipment which relays data on the network using ISO's OSI (Open System Interconnection) layer 2 (data link layer), box type equipment using the MAC address included in the destination information of the packet and has three or more communication ports.

Equipment Definition in Energy Conservation Law

Equipment for sending and receiving electronic telecommunication signals having the function of transmitting electronic telecommunication signals to a path determined separately for each destination from among two or more paths capable of transmission (limited to those used almost exclusively for the Internet; however excluding those capable of wireless telecommunication and others set forth under Ministerial Ordinance Number 39 from the Ministry of Economy, Trade and Industry*1).

*1: Exclusions provided under Article 48 (21) of Ministerial Ordinance Number 39 from the Ministry of Economy, Trade and Industry (exclusions from specified equipment) are as follows.

[1] Those that do not transmit and switch Ethernet frames
[2] Those that transmit and switch Internet protocol packets
[3] Those with connection ports for sending and receiving electric telecommunications signals having at least half of the connection ports utilize a two line connection
[4] Those designed to be built into a housing, electronic computer or other item.
[5] Those for controlling equipment that relay electrical telecommunications signal wirelessly
[6] Those set forth by the Minister of Economy Trade and Industry that are primarily for supplying power.

(2) Figure of merit

Adopt the assessment standard based on the top runner method for switching equipment (2009 Ministerial Notification No. 227 from the Ministry of Economy, Trade and Industry), identified as a specified equipment in the Energy Conservation Law.

Energy efficiency E = power consumption/maximum effective transmission rate (W /Gbps)

(3) Normative References

[1] Method for determining normative references

Adopt the assessment standard based on the top runner method for switching equipment, identified as specified equipment in the Energy Conservation Law.

[Normative References]

Specific normative references are as follows.

However, the normative references do not apply to models with P_d/P_{SA}, P_d/P_{SB}, P_d/P_{SC} or P_d/P_{SD} in excess of 16, per the following.

Category				Normative Reference: Standard energy efficiency ratio (W/Gbps)
Management functions	Type of management functions	IP filtering functions	Category name	
With management functions	With SNMP functions	With IP filtering functions	A	$E=(\alpha_A+P_A)/T$
		No IP filtering functions	B	$E=(\alpha_B+P_B)/T$
	With Web management and other management		C	$E=(\alpha_C+P_C)/T$

	functions			
No management functions			D	$E=(\alpha_D+P_D)/T$

Notes

1: "Management functions" refers to functions for a network manager to acquire such information as network components and communications status for the purpose of operating the network efficiently.

2: Values for α_A, α_B, α_C and α_D shall be calculated using the following formula.

$\alpha_A=0.578\times X1+1.88\times X2+15.9\times X3+\beta_A$

$\alpha_B=0.375\times X1+1.88\times X2+\beta_B$

$\alpha_C=0.375\times X1+1.133\times X2+\beta_C$

$\alpha_D=0.272\times X1+1.133\times X2+\beta_D$

The value for α_A, α_B, α_C or α_D shall be 3 in cases where the equipment has only a 100 Mbps port, or where the equipment has a 100 Mbps port and a 1 Gbps port and the value for α_A, α_B, α_C and α_D is less than 3. Furthermore, the value for α_A, α_B, α_C or α_D shall be 4.5 in the event the equipment has only a 1Gbps port and the value for α_A, α_B, α_C or α_D is less than 4.5.

3: The value for X1 is the number of ports (unit: number of ports) with a line speed of 100 Mbps. The value for X2 is the number of ports (unit: number of ports) with a line speed of 1 Gbps. The value for X3 is the number of ports (unit: number of ports) with a line speed of 10 Gbps.

4: Use the values provided in the following table for β_A, β_B, β_C and β_D based on the appropriate categorization.

	β_A	β_B	β_C	β_D
Has only a 100Mbps port	3.976	3.4	3.4	0.824
Has only a 1Gbps port	9.94	−5.07	−2.074	−2.074
Has only a 10Gbps port	0	0	0	0
Has a 100Mbps port and one 1 Gbps port	2.276	1.7	2.447	1.494
Has a 100Mbps port and two or more 1 Gbps ports	0.576	0	1.494	1.494
Has a 1Gbps port and a 10Gbps port	-10.24	0	0	0

5: The values for P_A, P_B, P_C and P_D shall be calculated using the following formula.

$P_A=(0.0347\times P_d/P_{SA})/(1-0.0347\times P_d/P_{SA})\times\alpha_A$

$P_B=(0.0347\times P_d/P_{SB})/(1-0.0347\times P_d/P_{SB})\times\alpha_B$

$P_C=(0.0347\times P_d/P_{SC})/(1-0.0347\times P_d/P_{SC})\times\alpha_C$

$P_D=(0.0347\times P_d/P_{SD})/(1-0.0347\times P_d/P_{SD})\times\alpha_D$

6: The values for P_{SA}, P_{SB}, P_{SC} and P_{SD} shall be calculated using the following formula.

$P_{SA}=\alpha_A\times0.85+1$

$P_{SB}=\alpha_B\times0.85+1$

$P_{SC}=\alpha_C\times0.85+1$

$P_{SD}=\alpha_D\times0.85+1$

7: P_d represents the value for maximum power supply (unit: W) for power over Ethernet. If the equipment has no power over Ethernet function, use 0.

8: T represents the value for maximum effective transmission rate (unit: Gbps) when the frame length is 1,518 bytes.

[Approximate Date for Achieving Normative References]

End of Fiscal Year 2011 (adopted the target fiscal year per the standard on switching equipment (2009 Ministerial Notification No. 227 from the Ministry of

Economy, Trade and Industry), specified in the Energy Conservation Law)

[2] Assessment scale references

Set a threshold using the rate of reduction versus the power consumption at normative reference (Note 1). In assessment scale, the rank including normative reference shall be ★★.

(Note 1) Rate of reduction of power consumption vs. NR shall be comparable for equipment with similar maximum effective transmission rates.

Assessment scale	Rate of reduction vs. power consumption at NR	Energy efficiency ratio per category En（W/Gbps）				Notes
		A	B	C	D	
★★★★★	n≧30%	En≦E×0.7				Normative Reference E (W/Gbps) per table under (3) Normative References
★★★★	20%≦n＜30%	Ex0.7<En≦E×0.8				
★★★	10%≦n＜20%	Ex0.8<En≦E×0.9				
★★ （includes NR）	0%≦n＜10%	E×0.9<En≦E				
★	(Normative reference not achieved)	En>E				

(Note) In calculating energy efficiency ratio, calculate values to the first decimal place.

(4) Measurement Methodology

Measurement conditions are as follows taking into account the substance of the 2009 Ministerial Notification Number 227 from the Ministry of Economy, Trade and Industry, which sets forth judgment standards, among other things, for manufacturers of switching equipment per the stipulations of the Energy Conservation Law.

[1] For energy efficiency, use the value resulting from dividing the value expressed in W, representing power consumption during maximum effective transmission rate when the frame length to be measured is 1,518 bytes, by a value expressed in Gbps, representing the aforementioned effective transmission rate.

[2] Conditions for measuring power consumption and maximum effective transmission rate are as follows.

(a) The value for maximum effective transmission rate is calculated using the following formula.

$$T = R \times (L+20) \times 8/10^9$$

In this formula, T, R and L represent the following values.

T: Maximum effective transmission rate when the frame length is 1,518 bytes

R: The total number of frame output per second from all ports
L: Frame length (unit: bytes)

(b) Set switch so as to perform switching of received frames. Switching is the relay of data on a network using layer 2 (data link layer) of a reference model indicated in Basic Reference Model 6 of Open Systems Interconnection stipulated in Japan Industrial Standard X5003. Specifically, relay is performed referring to the MAC address.
(c) Use frames for unicast transmission.
(d) The data pattern of the header section is arbitrary. Use 0 for all data patterns of the frame to be measured.
(e) Measurement dependent on type of cascade connection at the ports are permissible. In such cases, calculate maximum effective transmission rate considering the number of cascade-connected ports.
(f) When measuring energy efficiency ratio, it is acceptable to transmit the minimum frames required according to the maximum effective transmission rate of the switch.
(g) Components that can be removed and functions that can be disabled without sacrificing the basic performance and functioning of the switch shall be removed or disabled, respectively, for the measurement.
(h) Ports not used in the measurement can be linked down.
(i) The peripheral temperature shall fall within the range of 16 to 32°C.
(j) Power voltage shall be within the range of ±10% of rated input voltage (100V or 200V) if the power source is AC and within the range of DC-57V to DC-40.5V if the power source is DC.
(k) Use rated frequency for AC power source frequency.
(l) Conduct measurements with the switch in a stationary state.
(m) For products using an AC power source, measure power consumption at the power plug terminal.
(n) In the case of AC power, use effective power as power consumption.

(5) Assessment Result and Assessment Scale Ranking

[1] Assessment result

The assessment result shall be the figure of merit actually measured by the vendor according to 5.2.2.1(4) Measurement Methodology.

[2] Assessment scale ranking

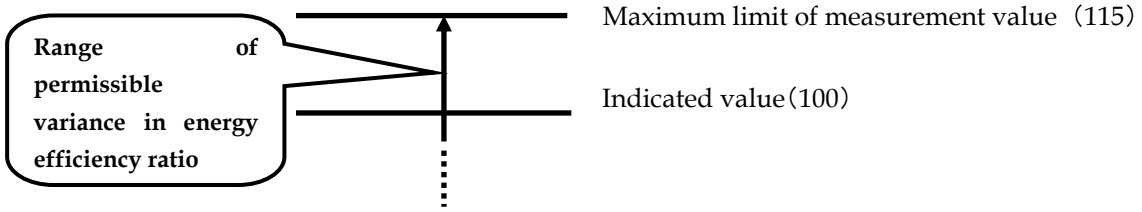
The assessment scale ranking (★-★★★★★) shall be based on normative reference and assessment result.

[3] Variance in assessment result

Values specified in 2009 Ministerial Notification No. 226 from the Ministry of Economy, Trade and Industry (2010 METI Notification No. 149 revised version) shall apply.

The specific range of permissible variance in assessment results shall be x/115 of the energy efficiency ratio of individual equipment, where x is a

figure of 100 or more.
As indicated in the diagram below, this means that where the assessment result of the individual equipment is 100, the measurement value of the energy efficiency ratio (energy consumption (W)) cannot exceed 115.
In other words, the range of permissible variance of the indicated value is +15% or less.



5.2.3 Transport Equipment

5.2.3.1. WDM Equipment

(1) Equipment Definition

- WDM equipment is a product that performs info-communication functions over a single fiber-optic cable by multiplexing multiple optic signals of different wavelengths.
- WDM equipment from recent years may include devices that integrate OSI reference models from layer 2 (data link) to the layer 3 (network). Due to the difficulty of defining a standard device configuration, here, WDM equipment refers to devices equipped for only OSI layer 1 (physical).
- This guideline applies to WDM equipment used in terrestrial systems. Submarine systems are exempt. Furthermore, relay equipment is exempt because relay equipment consumes less power compared to terminal equipment.

[Functional Configuration Subject to This Guideline]

WDM equipment is categorized as follows based on WDM multiplexing method, OADM function and OADM method.

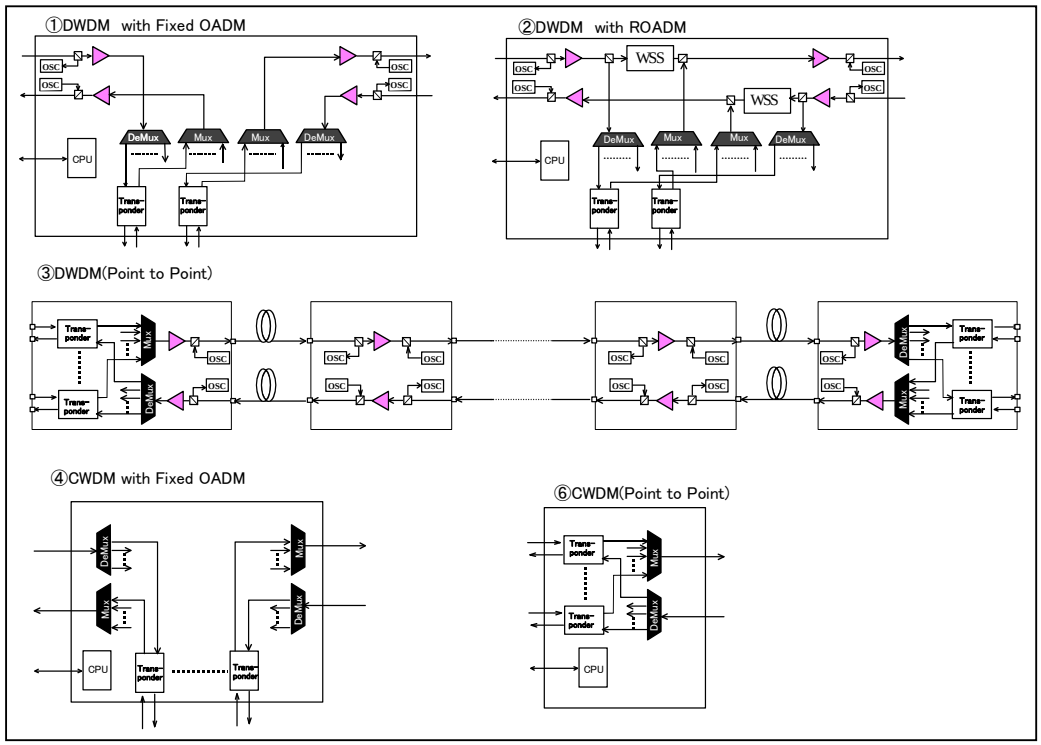
WDM multiplexing method	OADM function (Note 1)	OADM method	Classification	
DWDM (Note 2)	Yes	Fixed	①	DWDM with Fixed OADM
		Reconfigurable	②	DWDM with ROADM
	No	−	③	DWDM (Point-Point)
CWDM (Note 3)	Yes	Fixed	④	CWDM with Fixed OADM
		Reconfigurable	⑤	CWDM with ROADM
	No	−	⑥	CWDM (Point-Point)

Notes

1: Point-Point optical multiplexing/demultiplexing is considered to be included within OADM functions, but categories are expressed in terms of with or without OADM.

2: DWDM (Dense Wavelength Division Multiplexing): the number of wavelengths multiplexed is for the most part no less than 32ch. Primarily used in backbone and metro core networks.
3: CWDM (Coarse Wavelength Division Multiplexing): the number of wavelengths multiplexed is for the most part no more than 16ch. Primarily used in metro access and parts of metro core.

Among the above categories, 2) DWDM with ROADM and 6) CWDM (Point-Point) are subject to this Guideline, both of which are expected to exhibit energy-saving impact and for which future demand is forecast.



(2) Figures of merit

Use the figure of merit TEER (Telecommunications Energy Efficiency Ratio) (Note 1) for transport equipment stipulated by ATIS (Alliance for Telecommunications Industry Solutions), as follows.

$$TEER_{CERT} = D_{TEER}/P_{TEER\text{-}CERT}$$
$$= \Sigma Di/(P_{CERT\text{-}0}+P_{CERT\text{-}50}+P_{CERT\text{-}100})/3$$

$TEER_{CERT}$: Certified TEER measured at a specific configuration (Note 2)
D_{TEER}: Total data rate (bps)
$P_{TEER\text{-}CERT}$: Measured power consumption (W)
Di: Data rate (bps) at a given interface i
$P_{CERT\text{-}0}$: Measured power consumption (W) at a 0% data usage rate
$P_{CERT\text{-}50}$: Measured power consumption (W) at a 50% data usage rate
$P_{CERT\text{-}100}$: Measured power consumption (W) at a 100% data usage rate

(Note 1): ATIS-0600015.2009: General TEER base standard
(Note 2): ATIS-0600015.02.2009: Transport product category TEER

This figure of merit applies not only to WDM equipment but also to "transport equipment" including SONET/SDH equipment and the like.

<For WDM Equipment>

DWDM figure of merit: TEER = maximum throughput (Gbps) / average power consumption (W)
CWDM figure of merit: TEER = maximum throughput (Gbps) / average power consumption (W)

Note: Calculate average power consumption = (power consumption at full wavelength + power consumption at one wavelength) / 2.
Peak throughput is total throughput at full wavelength.

With WDM equipment, unlike packet interface cards, it is common to guarantee constant 100% transport; therefore,

$P_{CERT-0} = P_{CERT-50} = P_{CERT-100.}$

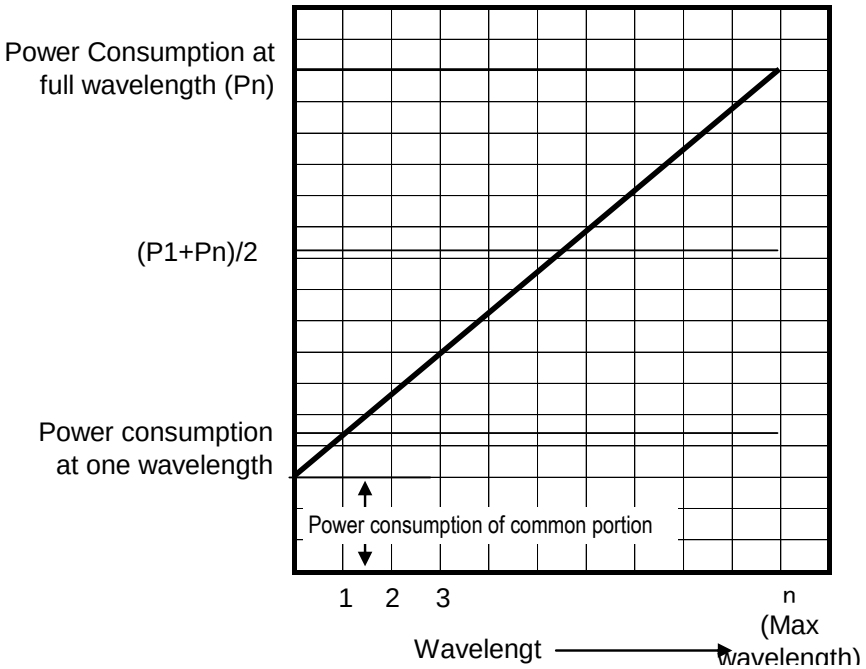
Thus, $TEER_{CERT}$ in WDM equipment under ATIS is in essence as follows.

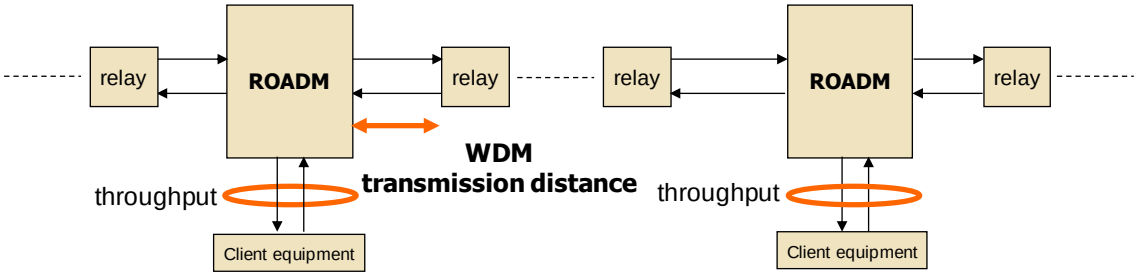
$TEER_{CERT} = D_{TEER}/P_{TEER-CERT}$
= maximum transmission capacity / power consumption when configured for maximum transmission capacity

(This is provided as a ROADM system example for ATIS-0600015.02.2009.)

In evaluating the power consumption of equipment, measure power consumption at one wavelength and at full wavelength, so as to provide visibility into low power consumption in common portions such as the optical amplifier and the optical multiplexer/demultiplexer, and use the following for average power consumption.

Average power consumption = (power consumption at full wavelength + power consumption at one wavelength) / 2





Given that equipment configuration differs by vender, it is preferable to use the following parameters, which rely largely on power consumption and enable stipulation through external interface.

> Total throughput on client side.

> Transmission distance of a section (Use 0.25dB/km)

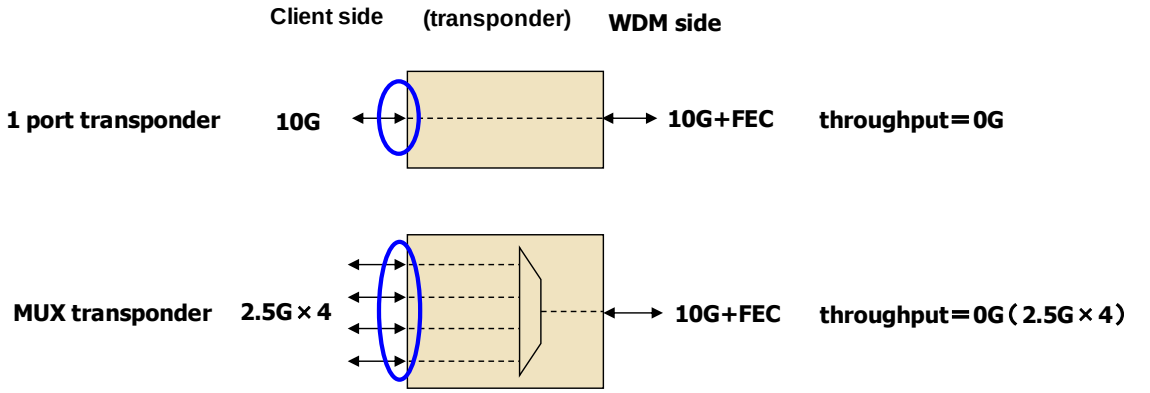
Generally, it is believed power consumption rises with an increase in these parameters. However, in the case of DWDM, the increase in power consumption in relation to transmission distance of a section is believed to be small in light of the overall figure.

For that reason, use as a metric value that results from dividing maximum throughput value by average power consumption and do not consider transmission distance of a section.

[Definition of Throughput]

Throughput is defined as the total effective client signal rate (converted to a single direction) passing through the device (does not include closed and attached FEC within WDM).

Example of throughput by transponder type



(3)

(3) Normative References

[1] Method for determining normative references

Normative references for DWDM and CWDM equipment shall be values derived by accounting for technological trends to the average metric values based on products shipped in Fiscal Year 2008 (CIAJ survey).

[Normative References]

DWDM equipment: 0.32 Gbps/W

CWDM equipment: 0.48 Gbps/W

[Approximate Date for Achieving Normative References]

End of Fiscal Year 2012

[2] Assessment scale references

Set a threshold using the rate of reduction versus the power consumption at normative reference. In assessment scale, the rank including normative reference shall be ★★.

Reference example 1) Average power consumption at normative reference for 800 Gbps DWDM equipment is 2,500 W.

Reference example 2) Average power consumption at normative reference for 40 Gbps CWDM equipment is 83.3 W.

Assessment scale	Rate of reduction vs. power consumption at NR	Average power consumption for 800GbpsDWDM	Average power consumption for 40GbpsCWDM
★★★★★	n≧30%	P≦1,750	P≦58.4
★★★★	20%≦n＜30%	1,750W＜P≦2,000	58.4W＜P≦66.7

★★★	10%≦n<20%	2,000W<P≦2,250	66.7W<P≦75.0W
★★ (includes NR)	0%≦n<10%	2,250W<P≦2,500	75.0W<P≦83.3
★	Normative reference not achieved	P>2,500	P>83.3

(Note) In power consumption, calculate values to the first decimal place.

(4) Measurement Methodology

[1] Measurement configuration

(a) Subject: 1 equipment (not in units of frames or shelves)

(b) Mounting: Configure and equip with function blocks for maximum throughput

(c) Power source: Redundant configuration (DC)

(d) Optic cable connection:

> All mounted within device

> Corresponds to measuring equipment on client side

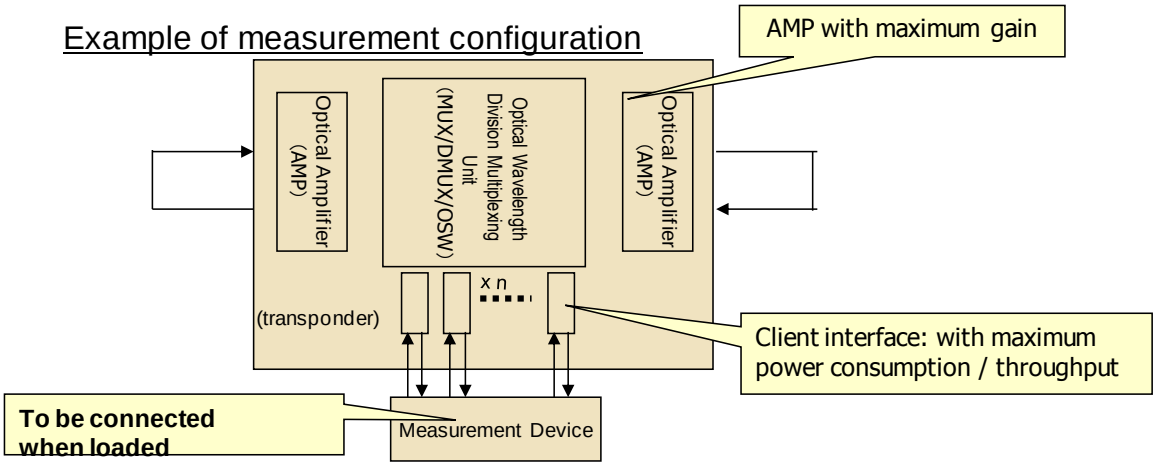
> Corresponds to return path of transmission

(e) Basic configuration

> Use Ring for DWDM with ROADM

>Use point to point for CWDM

Example of measurement configuration



[2] Measurement conditions

(a) Environmental conditions: Temperature of 25°C ±5°C (no stipulations for humidity or air pressure)

(b) Measurement precision: ± 1%

(c) Test voltage: - 48V ± 1V in DC

(d) Slot mounting: Full mounting (use maximum mounting regardless of redundancy)

- Maximum mounting refers to the state that maximizes equipment throughput.
- Where different types of optical amps exist, equip with that which provides maximum distance of a span.

- Mount all cables

(e) Load conditions:
> 1 wave (minimum wavelength count but maximum bandwidth)
> Full wavelength (maximum bandwidth)

(f) Points to note in testing: Stabilize by running for 15 continuous minutes under stipulated conditions before taking measurements.

(5) Assessment Result and Assessment Scale Ranking

[1] Assessment result

The assessment result shall be the figure of merit actually measured by the vendor according to 5.2.3.1(4) Measurement Methodology.

[2] Assessment scale ranking

The assessment scale ranking (★-★★★★★) shall be based on normative reference and assessment result.

[3] Variance in assessment result

Permissible variance due to differences in equipment (units) shall be determined in the future.

The average of the actual measurement values for the figure of merit attained by the vendor shall be submitted as the assessment result.

5.2.4 PON Equipment

5.2.4.1. GE-PON Equipment

(1) Equipment Definition

[Common Items]

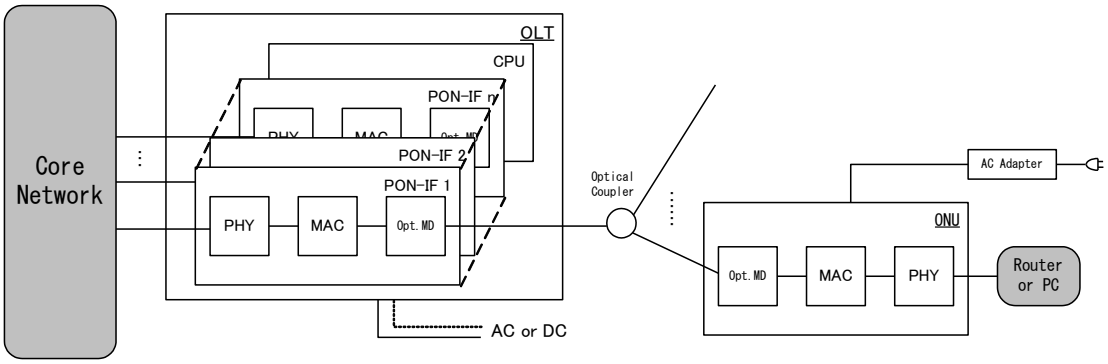
Ethernet PON equipment in compliance with or an extension of IEEE802.3ah, providing a maximum transmission rate of 1 Gbps.

OLT (Note 1)

- Power source specifications (AC or DC)
- No line concentrator functions (Note 2)

ONU (Note 3)

- Power source specifications (AC) (Note 4)
- Standalone functions only. Compound functions not included. (Note 5)
- UNI type (100 Mbps or 1 Gbps)



Notes
1: NNI I/F and the number of ports not stipulated. QoS and functions such as priority control not stipulated. Number of branches also not stipulated.
2: The scope of this Guideline covers OLT for the domestic carrier market only. If the OLT has functions other than PON (such as line concentrator functions), disable those functions before taking measurements.
3: UNI I/F and the number of ports not stipulated. QoS and functions such as priority control not stipulated.
4: The scope of this Guideline covers ONU for the domestic consumer market only. AC adapter power supply is standard for ONU domestic consumer market.
5: If the ONU has multiple functions, disable those functions before taking measurements.

(2) Figures of merit

- For OLT, use a value that divides average power consumption for the OLT (at full mounting), measured using DC input if the product power source is DC and AC input if the power source is AC, by the total number of lines (Total number of IF ports × number of PON branches).

  OLT figure of merit: E = average power consumption (W)/total number of lines

- For ONU, use ONU average power consumption measured on the supply side of the AC adapter.

  ONU figure of merit: P = average power consumption (W)
  Note:
  Average power consumption = (power consumption at 100% load + power consumption at 50% load + power consumption at 0% load) / 3
  Total number of lines = total number of IF ports × 32

The above metrics shall be used as figure of merit not only for GE-PON, but also for "PON Equipment" including G-PON and 10G-PON.

(3) Normative References

[1] Method for determining normative references

Normative references for DWDM and CWDM equipment shall be values derived by accounting for technological trends to the average metric values based on products shipped in Fiscal Year 2008 (CIAJ survey).

[Normative References]
OLT: 0.46 W (AC) or 0.42 W (DC)
ONU: 3.68 W (100Mbps) or 4.45 W (1Gbps)

[Approximate Date for Achieving Normative References]

End of Fiscal Year 2012

[2] Assessment scale references

Set a threshold using the rate of reduction versus the power consumption at normative reference. In assessment scale, the rank including normative reference shall be ★★.

Average power consumption for OLT normative references: 0.46 W (AC power supply) or 0.42 W (DC power supply)

Average power consumption for ONU normative references: 3.68 W (100 Mbps) or 4.45 W (1 Gbps).

OLT Power Consumption Values

Assessment scale	Rate of reduction vs. power consumption at NR	Average power consumption for OLT (AC power source) (W)	Average power consumption for OLT (DC power source) (W)
★★★★★	n≧30%	E≦0.322	E≦0.294
★★★★	20%≦n＜30%	0.322W＜E≦0.368	0.294W＜E≦0.336
★★★	10%≦n＜20%	0.368W＜E≦0.414	0.336W＜E≦0.378
★★ (includes NR)	0%≦n＜10%	0.414W＜E≦0.46	0.378W＜E≦0.42
★	Normative reference not achieved	E＞0.46	E＞0.42

(Note) In power consumption, calculate values to the third decimal place.

ONU Power Consumption Values

Assessment scale	Rate of reduction vs. power consumption at NR	Average power consumption for ONU (100 Mbps)	Average power consumption for ONU (1 Gbps)
★★★★★	n≧30%	P≦2.576	P≦3.115
★★★★	20%≦n＜30%	2.576＜P≦2.944	3.115＜P≦3.56
★★★	10%≦n＜20%	2.944＜P≦3.312	3.56＜P≦4.005
★★ (includes NR)	0%≦n＜10%	3.312＜P≦3.68	4.005＜P≦4.45
★	Normative reference not achieved	P＞3.68	P＞4.45

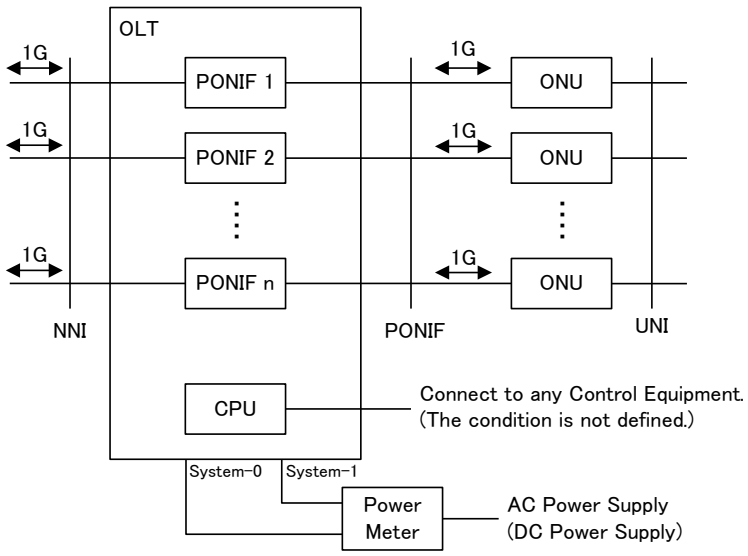
(Note) In power consumption, calculate values to the third decimal place.

(4) Measurement Methodology

[1] Measurement configuration

[OLT]

For OLT, use 1 Gbps for both the NNI side and the PON side and use the following three settings for load factor. Furthermore, in stipulating load factor, the load factor specified by data entry side shall be used (NNI or UNI).



100% load factor: a state where 64 byte frames flow continuously (without interruption).
50% load factor: the state where 512 byte frames flow 50%.
0% load factor: the state where frames are not flowing.

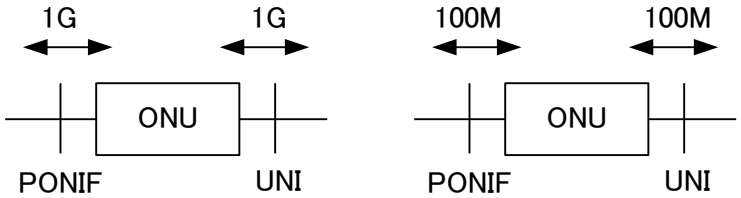
[ONU]

For ONU, carry out measurements using configurations (a) and (b). As in the case of OLT, apply three load factor settings.

(a) 1 Gbps on PON side, 1 Gbps on UNI side

(b) 100 Mbps on PON side, 100 Mbps on UNI side

Furthermore, in stipulating load factor, as in the case of OLT, it shall be acceptable to use the load factor specified by data entry sites (NNI or UNI).



[2] Measurement conditions

(a) Temperature: room temperature (around 25°C ± 5°C)

(b) Humidity: no stipulation

(c) Air pressure: no stipulation

(d) Power supply conditions:

Using AC voltage: AC 100 V ± 10% (50/60Hz ± 1%)

Using DC voltage: DC -48 ± 1 V

(5) Assessment Result and Assessment Scale Ranking

[1] Assessment result

The assessment result shall be the figure of merit actually measured by the

vendor according to 5.2.4.1(4) Measurement Methodology.

[2] Assessment scale ranking

The assessment scale ranking (★-★★★★★) shall be based on normative reference and assessment result.

[3] Variance in assessment result

Permissible variance due to differences in equipment (units) shall be determined in the future.

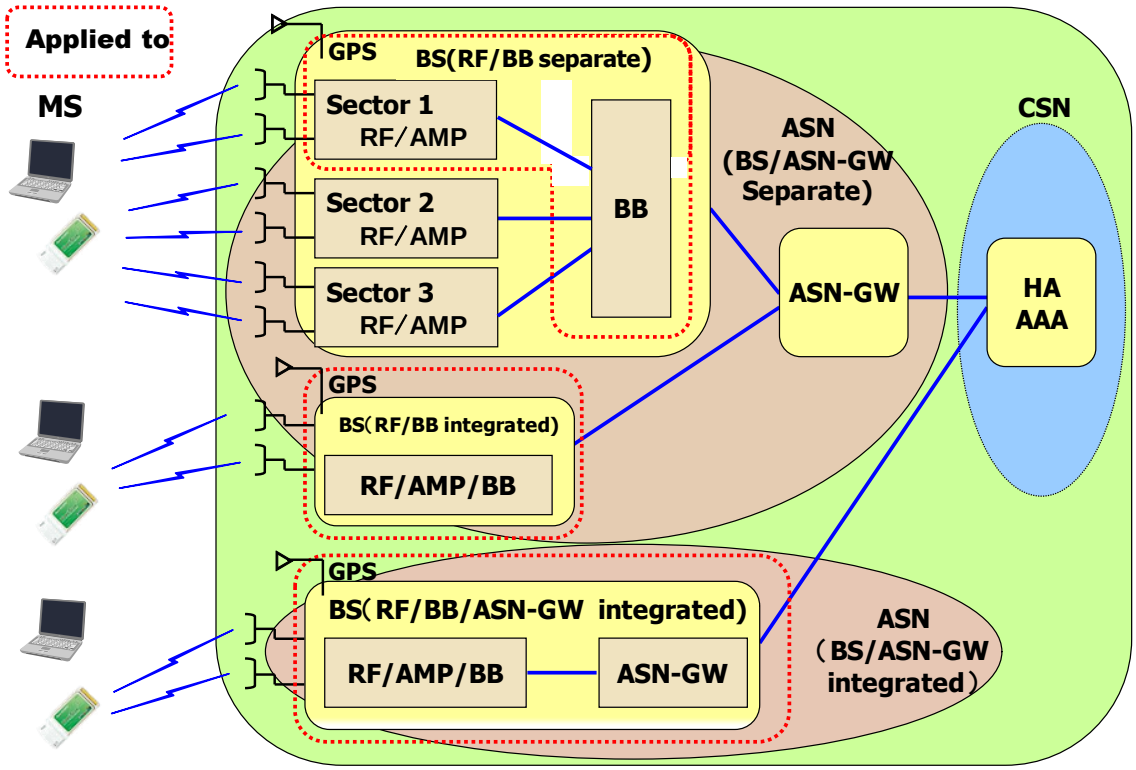
The average of the actual measurement values for the figure of merit attained by the vendor shall be submitted as the assessment result.

5.2.5 Broadband Base Station Equipment

5.2.5.1. WiMAX™ Base Station Equipment

(1) Equipment Definition

- Mobile WiMAX base station equipment in compliance with IEEE802.16e.
- Applies to BS (Base Station, WiMAX base station) only and does not include MS (Mobile Station, WiMAX subscriber device) and higher end core network equipment.
- BS equipment takes the following three configurations.
  - [1] RF (radio frequency) and BB (baseband) separate-type.
  - [2] RF and BB integrated.
  - [3] RF and BB integrated with ASN-GW (Access Service Network Gateway).



Notes
AAA: Authentication, Authorization, and Accounting;
AMP: Amplifier; ANT: Antenna;
ASN: Access Service Network; ASN-GW: Access Service Network Gateway;
BB: Base Band; BS: Base Station、WiMAX base station;
CSN: Connectivity Service Network;
GPS: Global Positioning System
HA: Home Agent;
MS: Mobile Station、WiMAX subscriber device ;
RF: Radio Frequency

[Common Equipment Specifications and Equipment Configurations]

Equipment specifications/ configuration	Item	Specifications
Equipment specifications	Frequency band	2,595MHz - 2,625MHz or 2,582MHz - 2,592MHz
	Signal bandwidth	10MHz
	Duplex operation	TDD
	Wireless access system / modulation system	SOFDMA/QPSK, 16QAM, 64QAM (※) ※64QAM is down link only
	FFT size	1024
	UL/DL frame ratio	DL/UL : (29:18)
	Segmentation	None
	Inter-base station synchronization system	GPS
Equipment configuration	Antenna configuration	MIMO Matrix-A or Matrix-B(2TX+2RX)

Notes:

SOFDMA: Scalable Orthogonal Frequency Division Multiple Access;
DL: Down Link; UL: Up Link;
QAM: Quadrature Amplitude Modulation;
QPSK: Quadrature Phase Shift Keying;
FFT: Fast Fourier Transform;
MIMO: Multiple Input Multiple Output;
FFT: Fast Fourier Transform

[Categorized Equipment Specifications and Equipment Configurations]

Equipment specifications / configuration	Item	Classification specification
Equipment specifications	RF output power	① 10W+10W ② 5W+5W
	Primary power supply	① AC ② DC
	Network interface	① Number of optical ports: N ② Number of electrical ports: M
	Transmission carrier count	① 1 ② 2 ③ 3
	Baseband processor	① single (1) ② dual (2)
Equipment configuration	RF/BB configuration	① Integrated ② Separate

The above items may be combined independent of each other.
Of those combinations, the following three types, which are currently commercialized and thus measurable, are subject to this guideline.

Name	Integrated 10W equipment (1 BB system)	Integrated 10W equipment (2 BB systems)	Integrated 5W equipment (1 BB system)
Output power	10W+10W	10W+10W	5W+5W

Baseband processor	1 system	2 systems	1 system
RF/BB configuration	Integrated	Integrated	Integrated
Supply side power source input	AC	AC	AC

(2) Figures of merit

- Figure of merit for broadband base station equipment shall be the sum of RF output divided by the average primary supply-side power.

Figure of merit $E = \Sigma P_n / \{P_{idle} \times (1-\alpha) + P_{max} \times \alpha\}$

P_n: RF output power at antenna connector n (W)
P_{idle}: primary supply-side power when transmitting only the Preamble and MAP.
P_{max}: primary supply-side power at maximum transmission (W). The state where all down link symbols are being transmitted based on an MS connection or the test settings.
α: average of daily down link transmission traffic rate. Average daily traffic rate using down link Data Symbol, excluding Preambles and MAP.

<For WiMAX Two Antenna Base Station Equipment>
Since the daily average down link traffic is not available, calculate with α = 0.5 for the time being.

Figure of merit = $(P_{out1} + P_{out2}) / \{(P_{idle} + P_{max})/2\}$

P_{out1}: RF output power at antenna connecter # 1 (W)
P_{out2}: RF output power at antenna connecter # 2 (W)
P_{idle}: primary supply-side input power under idle mode (W)
P_{max}: primary supply-side input power during maximum transmission (W)

(3) Normative References

[1] Method for determining normative references

Normative references for the three types of WiMAX base station equipment stipulated above, namely, an integrated 10 W equipment (one system), integrated 10 W equipment (two systems), and integrated 5W equipment (one system) shall be values derived by accounting for technological trends to the average metric values based on current products (CIAJ survey).

[Normative References]

Integrated 10 W equipment (one system): 12.60

Integrated 10 W equipment (two systems): 9.63

Integrated 5W equipment (one system): 5.84

[Approximate Date for Achieving Normative References]

End of Fiscal Year 2012

[2] Assessment scale references

Set a threshold using the rate of reduction versus the power consumption at normative reference. In assessment scale, the rank including normative reference shall be ★★.

Average power consumption for normative reference of integrated 10 W equipment (one system): 158.7 W

Average power consumption for normative reference of integrated 10 W equipment (two systems): 207.7 W

Average power consumption for normative reference of integrated 5 W equipment (one system): 171.2 W

Assessment scale	Rate of reduction vs. power consumption at NR	Average power consumption normative reference for integrated 10W equipment (1BB) (W) (Note 1)	Average power consumption normative reference for integrated 10W equipment (2BB) (W) (Note 1)
★★★★★	n≧30%	P≦111.09	P≦145.39
★★★★	20%≦n＜30%	111.09＜P≦126.96	145.39＜P≦166.16
★★★	10%≦n＜20%	126.96＜P≦142.83	166.16＜P≦186.93
★★（ includes NR）	0%≦n＜10%	142.83＜P≦158.7	186.93＜P≦207.7
★	Normative reference not achieved	P＞158.7	P＞207.7

(Note) In power consumption, calculate values to the first decimal place.

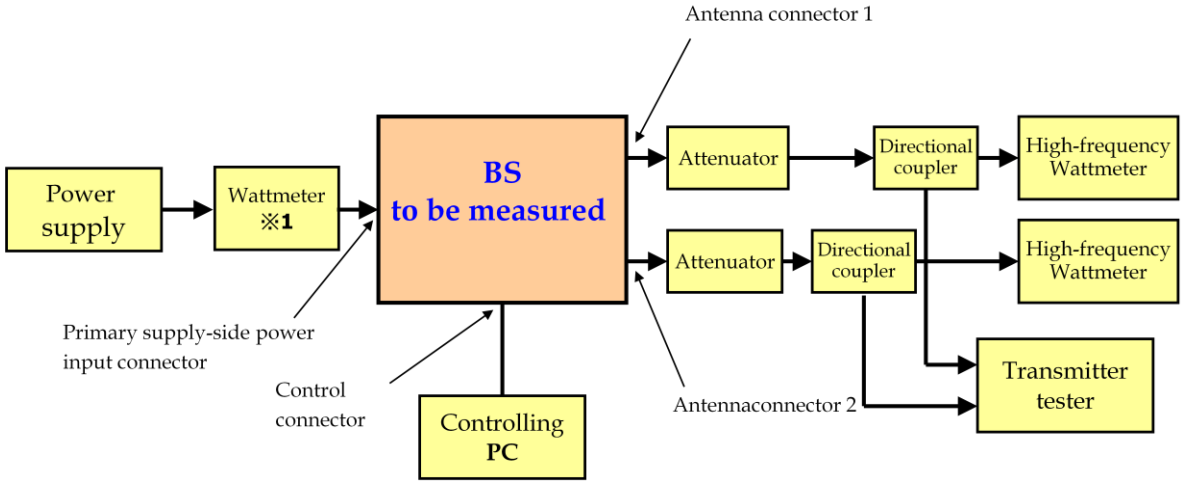
Assessment scale	Rate of reduction vs. power consumption at NR	Average power consumption normative reference for integrated 5W equipment (1BB) (W) (Note 2)	
★★★★★	n≧30%	P≦119.86	
★★★★	20%≦n＜30%	119.86＜P≦136.99	
★★★	10%≦n＜20%	136.99＜P≦154.11	
★★（includes NR）	0%≦n＜10%	154.11＜P≦171.2	
★	Normative reference not achieved	P＞171.2	

(Note) In power consumption, calculate values to the first decimal place.

Notes
1: When RF output power at antenna connecters are 10.0 W X 2
2: When RF output power at antenna connecters are 5.0 W X 2

(4) Measurement Methodology

[1] Measurement configuration



※1 An ammeter or voltmeter may be used in place of a wattmeter

[2] Measurement conditions

[Environment and Electrical Conditions]

Item		Conditions	Notes
Environment conditions	Room temperature	+25℃±5℃	
Primary power supply voltage	AC	Designated voltage ± 1%	50Hz or 60Hz
	DC	Designated voltage ± 0.5%	
Operating conditions	10W×2ANT	・Designated power no more than +12.2%(+0.5dB) ・Measure up to one decimal point	Measure transmission power using TELEC-T137 measurement method for antenna power.
	5W ×2ANT		

[Non-Environmental and Electrical Conditions]

(a) The number of units of BS equipment or AMP to be measured shall not be stipulated, but if multiple units are measured, the average figure shall be used.

(b) This guideline does not stipulate the number of times measurements shall be taken for each item in relation to a BS or AMP. However, use an average value when measuring multiple times.

(c) Measure the following functions after having provided continuous power supply to the equipment.
- Upstream receiving circuit, line interface, GPS circuit

(d) Begin measurements after the equipment has been exposed to room

temperature for one or more hours with the power on.

[Measurement methodology]

Item		Measurement method	
Primary supply side power at maximum RF output	P_{max}	Use an MS connection or test settings where all down link symbols are being transmitted.	• Measure using a wattmeter. • Use effective power consumption of the equipment when input is AC. • Acceptable to use Ampere meter/voltmeter when input is DC.
Primary supply-side input power under idle mode	P_{idle}	Configure so only down link preamble and MAP are being transmitted. (Data is PUSC)	

(5) Assessment Result and Assessment Scale Ranking

[1] Assessment result

The assessment result shall be the figure of merit actually measured by the vendor according to 5.2.5.1(4) Measurement Methodology.

[2] Assessment scale ranking

The assessment scale ranking (★-★★★★★) shall be based on normative reference and assessment result.

[3] Variance in assessment result

Permissible variance due to differences in equipment (units) shall be determined in the future.

5.2.5.2. LTE Base Station Equipment

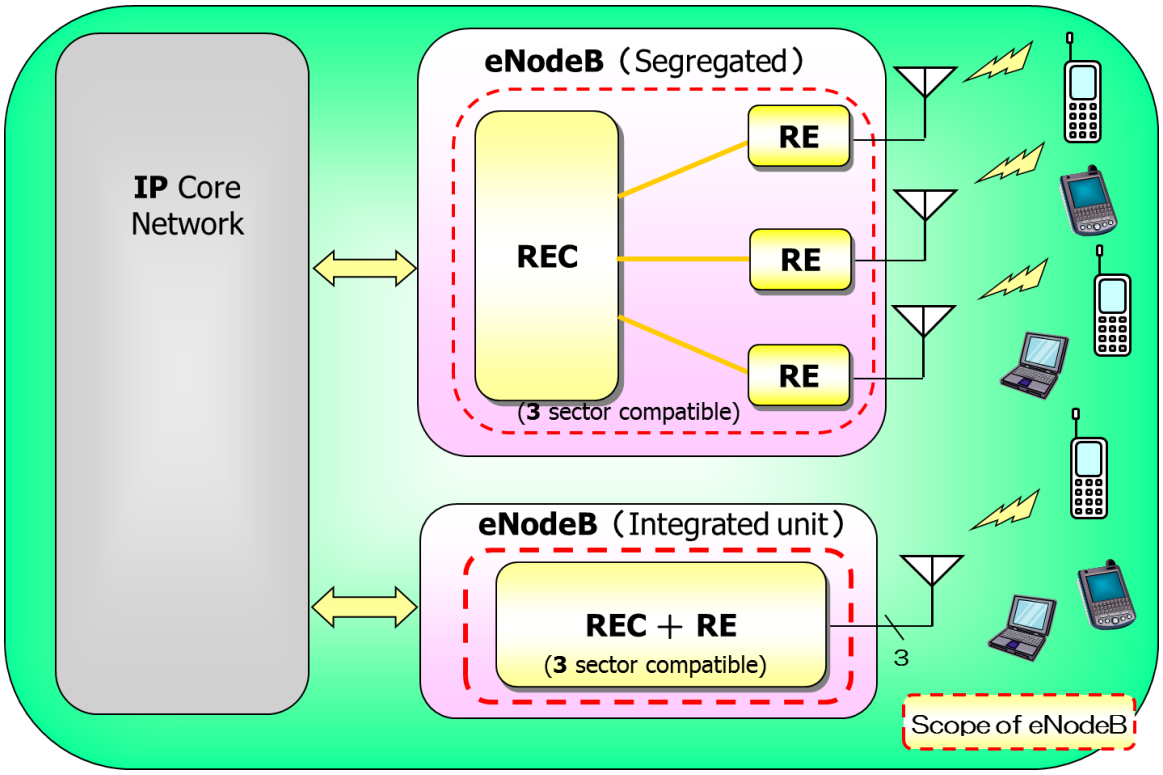
(1) Equipment Definition

- An LTE/E-UTRAN base station (eNodeB) that complies with 3GPP standards.
- Comprises of an eNodeB control unit and radio unit. Does not include maintenance tools, external power sources, rectifiers, remote tilt controller or the like.
- Scope applies to the following implemented configurations

Name	Segregated 20W Device	Integrated 20W Device	Segregated 10W Device
Output power per sector	20W + 20W	20W + 20W	10W + 10W
Radio unit and control unit configuration	Segregated	Integrated	Segregated

Note:

Segregated: Radio unit and control unit are driven by separate power sources.
Integrated: Radio unit and control unit are driven by the same power source.



Note:

3GPP: 3rd Generation Partnership Project

LTE: Long Term Evolution

E-UTRAN: Evolved UMTS Terrestrial Radio Access Network

eNodeB: evolved Node B　REC: Radio Equipment Control　RE: Radio Equipment

【Common　Equipment Specifications】

Item	Specifications	Notes
Frequency band	(Not specified)	For reference, provide frequency band information when submitting measurement data.
Signal bandwidth	10MHz	Measurement conditions
Number of carriers	1 Carrier	
Number of sectors	3	
Number of anntenas	Transmit: 2 Receive: 2 (space diversity)	MIMO
Radio access method	Transmit: OFDMA Receive: SC-FDMA	
Multiplexing method	FDD	
Modulation method	Transmit: QPSK, 16QAM, 64QAM Receive: QPSK, 16QAM	
S1 interface	Gigabit Ethernet x n	n:1 or more
Primary Power supply input	DC –48V	
Redundancy	Not applicable	

configuration		

MIMO:Multiple Input Multiple Output
OFDMA: Orthogonal Frequency Division Multiple Access
SC-FDMA: Single Carrier-Frequency Division Multiple Access
FDD: Frequency Duplex Division
QPSK: Quadrature Phase Shift Keying
16QAM:16 Quadrature Amplitude Modulation
64QAM:64 Quadrature Amplitude Modulation

(2) Figures of Merit

・ Broadband base station equipment figure of merit shall be a value that is the total transmission output divided by the average supply side power input.

Figure of Merit: $E = \Sigma P_n / 「P_{idle} \times (1-\alpha) + P_{max} \times \alpha」$

P_n: Transmitted power (W) of antenna connector n
P_{idle}: Primary supply-side input power (W) when there is no load, with the traffic resource block removed from E-TM1.1 of 3GPP TS36.141. Furthermore, operation conditions with no traffic (but with broadcast information) shall be permissible.
P_{max}: Primary supply-side input power (W) during maximum transmission, 3GPP TS36.141 E-TM1.1 transmission state
α: Daily average transmission traffic rate

＜LTE Two Antenna Base Station Equipment＞
Calculate using α＝0.5 due to lack of available operating data.

Figure of Merit: $E = (P_{out1} + P_{out2}) / 「(P_{idle} + P_{max})/2」$

P_{out1}: Transmission power (W) from antenna connector 1
P_{out2}: Transmission power (W) from antenna connector 2
P_{idle}: Primary supply-side input power (W) when there is no load
P_{max}: Primary supply-side input power (W) during maximum transmission

(3) Normative References

[1] Method for determining normative references

Normative references for the abovementioned three types of LTE base station equipment (Segregated 20W Device, Integrated 20W Device, Segregated 10W Device) shall reflect improvements upon average values for current products (per CIAJ) based on technical trends.

【Normative References】
Segregated 20W Device: 20.32(%)
Integrated 20W Device: 13.77(%)
Segregated 10W Device: 6.91(%)

【Approximate Date for Achieving Normative References】
End of Fiscal Year 2013

[2] Assessment scale references

Set a threshold using the rate of reduction versus the power consumption at normative reference. In assessment scale, the rank including normative reference shall be ★★.

Average power consumption for normative reference for segregated 20W equipment: 590.55W

Average power consumption for normative reference for integrated 20W equipment: 871.46W

Average power consumption for normative reference for segregated 10W equipment: 868.31W

Assessment Scale	Rate of reduction vs. power consumption at NR	Average power consumption normative reference (W) for segregated 20W equipment (Note 1)	Average power consumption normative reference (W) for integrated 20W equipment (Note 1)
★★★★★	n≧30%	P≦413.38	P≦610.02
★★★★	20%≦n＜30%	413.38<P≦472.44	610.02<P≦697.16
★★★	10%≦n＜20%	472.44<P≦531.49	697.16<P≦784.31
★★ (include NR)	0%≦n＜10%	531.49<P≦590.55	784.31<P≦871.46
★	Normative reference not achieved	P>590.55	P>871.46

Assessment Scale	Rate of reduction vs. power consumption at NR	Average power consumption normative reference (W) for segregated 10W equipment (Note 2)	
★★★★★	n≧30%	P≦607.81	
★★★★	20%≦n＜30%	607.81<P≦694.64	
★★★	10%≦n＜20%	694.64<P≦781.47	
★★ (include NR)	0%≦n＜10%	781.47<P≦868.31	
★	Normative reference not achieved	P>868.31	

(Note) In power consumption, calculate values to the first decimal place.

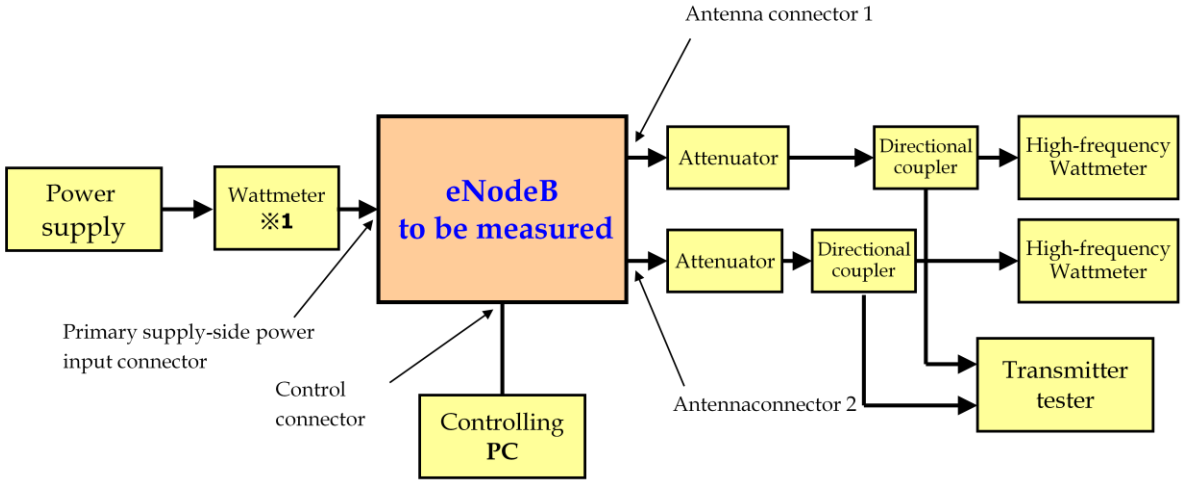
Notes

1: When transmission output power is 20 W × 2
2: When transmission output power is 10 W × 2

(4) Measurement Methodology

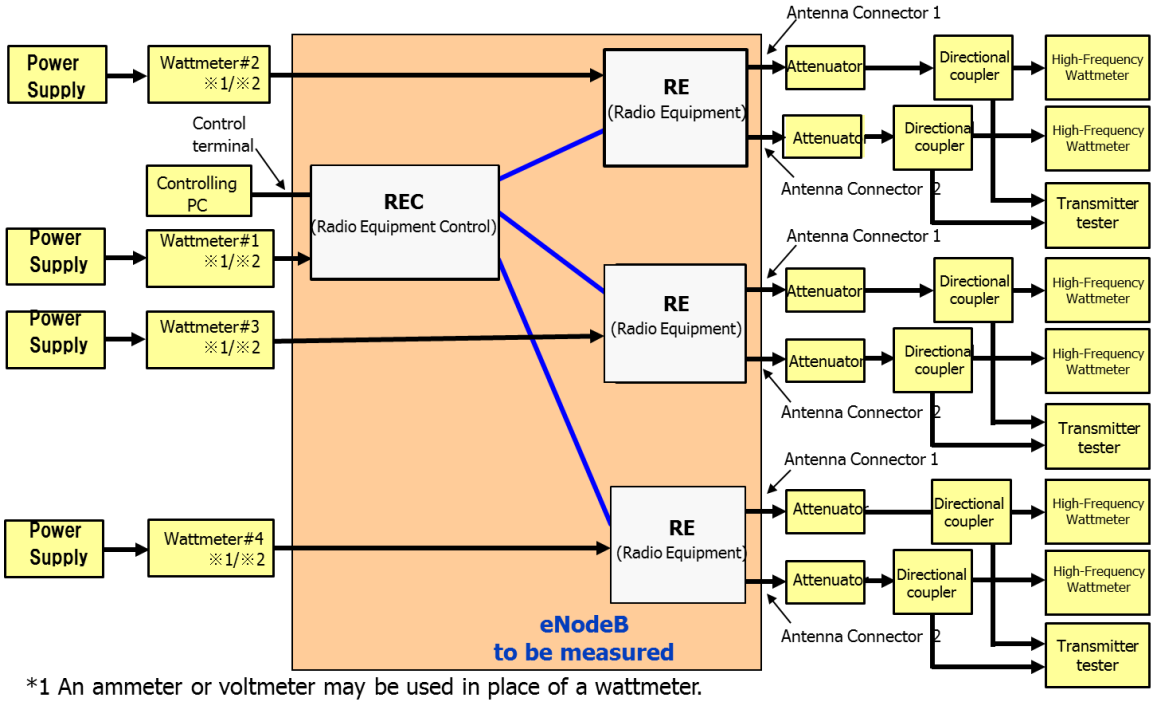
[1] Measurement configuration

【Integrated】



※**1** An ammeter or voltmeter may be used in place of a wattmeter

【Segregated】



*1 An ammeter or voltmeter may be used in place of a wattmeter.
*2 The eNodeB power consumption is the sum of wattmeters #1 through #4.

[2] Measurement conditions

【Environment and Electrical Conditions】

Item	Condition	Notes

Environment conditions	Room temperature	+25℃±5℃	
Primary supply-side input power voltage	DC	DC -48V ± 1%	
Operating conditions	20W×2ANT 10W ×2ANT	・No more than Designated power +12.2%（+0.5dB） ・Measure up to one decimal point	Measure transmission power using TELEC-T137 measurement method for antenna power.

【Non-Environmental and Electrical Conditions】

(a) This guideline does not stipulate the number of units of eNodeB equipment to be measured. However, use an average value when measuring multiple units.

(b) This guideline does not stipulate the number of times measurements shall be taken for each item in relation to an eNodeB equipment. However, use an average value when measuring multiple times.

(c) The following functions are necessary functions for an eNodeB and the measurement shall be conducted when continuous power is supplied to these functions.

・Upstream receiving current, line interface, (S1/X2 interface), RRC processor, MAC processor, RLC processor, and PDCP processor.

(d) Begin measurements after the equipment has been exposed to room temperature for one or more hours with the power on.

MAC: Medium Access Control, PDCP: Packet Data Convergence Protocol,
RLC: Radio Link Control, RRC: Radio Resource Control

【Measurement Methodology】

Item		Measurement method	
Primary supply-side input power at maximum transmission power	Pmax	Set to 3GPP TS36.141 E-TM1.1 transmission state.	Measure using a wattmeter. (Using an ammeter or voltmeter is acceptable.)
Primary supply-side input power when there is no load	Pidle	Set to the transmission state removed the traffic resource blocks from the 3GPP TS36.141 E-TM1.1. Furthermore, operation conditions with no traffic (but with broadcast information) shall be permissible.	

(5) Assessment Result and Assessment Scale Ranking

[1] Assessment result

The assessment result shall be the figure of merit actually measured by the vendor according to 5.2.5.2(4) Measurement Methodology.

[2] Assessment scale ranking

The assessment scale ranking (★-★★★★★) shall be based on normative reference and assessment result.

[3] Variance in assessment result

Permissible variance due to differences in equipment (units) shall be determined in the future.

5.2.6. Power Equipment

5.2.6.1. External Power Source (AC Adapters)

(1) Equipment Definition

In this Guideline, the term refers to an AC-DC converter that takes AC commercial power supply and provides DC power to the equipment.

This assessment applies to external power sources for customer-premises equipment having a name plate output (rated output) P_{no} (P_{no}: Nameplate Output Power) of $1W<Pno\leqq 49W$.

This assessment applies to AC adapters procured separately. Those which come as an attachment with equipment shall be assessed as part of the equipment itself and shall be excluded from the assessment of this section.

(2) Figure of merit

The figures of merit are established in reference to the figures of merit set forth under the International Efficiency Marking Protocol. Evaluate average conversion efficiency η at nameplate output P_{no} (W) based on conversion efficiency at 25% load η_{25}, conversion efficiency at 50% load η_{50}, conversion efficiency at 75% load η_{75} and conversion efficiency at 100% load η_{100}.

$$\eta=(\eta_{25}+\eta_{50}+\eta_{75}+\eta_{100})/4$$

(3) Normative References

[1] Method for determining normative references

- Normative references are established in reference to International Efficiency Marking Protocol.
- Decide individual normative references for each nameplate output.

[Normative References]

As a normative reference for external power sources, average conversion efficiency value at nameplate output P_{no} (W) shall be equivalent to Mark V of the International Efficiency Marking Protocol

[Approximate Date for Achieving Normative References]

April 2011 (as required by the EuP Directive (Directive on Eco-Design of Energy Using Products).

[2] Assessment scale references

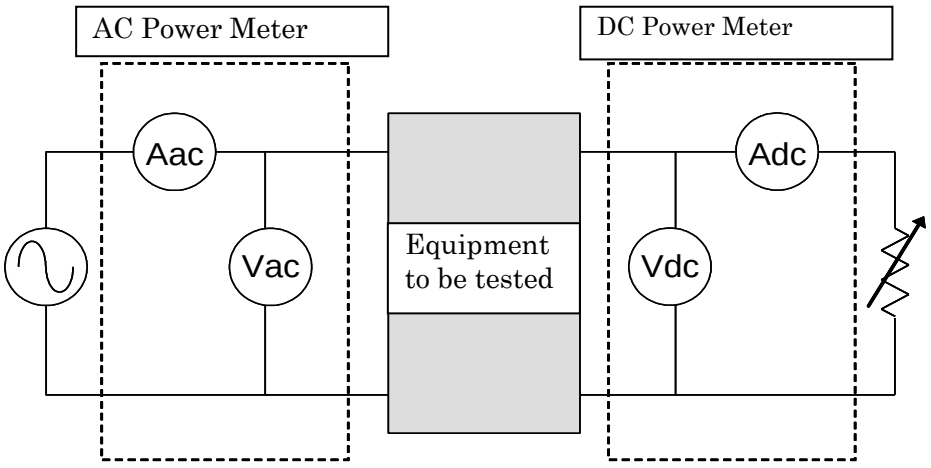
Set a threshold using the rate of reduction versus the power consumption at normative reference. In assessment scale, the rank including normative reference shall be ★★.

Assessment scale	Rate of reduction vs. power consumption at NR	Average conversion efficiency η (See formula (＊))
★★★★★	n≧30%	$\eta \geqq 70.7+5.00\ln(P_{no})$
★★★★	20%≦n<30%	$67.7+5.46\ln(P_{no}) \leqq \eta < 70.7+5.00\ln(P_{no})$
★★★	10%≦n<20%	$64.8+5.88\ln(P_{no}) \leqq \eta < 67.7+5.46\ln(P_{no})$
★★ (includes NR)	0%≦n<10%	$62.2+6.26\ln(P_{no}) \leqq \eta < 64.8+5.88\ln(P_{no})$
★	Normative reference not achieved	$\eta < 62.2+6.26\ln(P_{no})$

(Note) P_{no}: Nameplate Output Power (W)

(4) Measurement Methodology

[1] Measurement system



Example of a measurement system using variable resistance

Using variable resistance, measure conversion efficiencies η_{100}, η_{75}, η_{50} and η_{25} at nameplate currents of 100%, 75%, 50%, and 25%, respectively, and seek the average value η.

[2] Measurement conditions

- Room temperature: 23°C ± 5°C
- Error tolerance of measurement equipment: use a calibrated voltmeter/ammeter or wattmeter.

Error tolerance: No more than 2% error for the ammeter/voltmeter. Precision of no less than 0.01 W for the wattmeter.

- Voltage applied: Measure upon applying voltage of 100 V (± 1 V) at frequencies of 50 Hz (± Hz) and 60 Hz (± 0.6 Hz).
- Preparations prior to measurement: Begin measurements after running 100% nameplate current through the external power source to be tested for no less than 30 minutes.

(5) Assessment Result and Assessment Scale Ranking

[1] Assessment result

The assessment result shall be the figure of merit actually measured by the vendor according to 5.2.6.1(4) Measurement Methodology.

[2] Assessment scale ranking

The assessment scale ranking (★-★★★★★) shall be based on normative reference and assessment result.

[3] Variance in assessment result

Permissible variance due to differences in equipment (units) shall be determined in the future.

Until then, submit the average measurement value of the figure of merit determined by the vendor as the assessment result.

5.2.6.2. Rectifiers

(1) Equipment Definition

A rectifier refers to AC-DC converters that receive primary energy from a commercial power supply, and supplies DC power to a network equipment, while floating-charges a storage battery, which is a backup power source.

Applies to modules having a power conversion function of power supply for telecommunications or cellular phone base stations.

However, this standard power supply does not apply to wireless base stations other than cellular phone base stations or to thyristor rectifiers. Furthermore, the output voltage is a nominal DC−48V.

(2) Figure of Merit

The figure of merit is based on ATIS specified TEER※1, and shall be calculated using the following formula.

$$TEER = \frac{\sum_{i=3}^{8} \eta(i \times 10\%)}{6} \times 1{,}000$$

$$\eta = \frac{P_{out}}{P_{in}}$$

Single-phase AC input: P_{in}[input power] = V_{in}[input voltage] x I_{in}[input current] x PF[power factor]

Three-phase AC input: $P_{in} = V_{in} \times I_{in} \times PF \times \sqrt{3}$

DC output: P_{out}[output power] = V_{out}[output voltage] x I_{out}[output current]

※1: ATIS-0600015.04.2010: Energy Efficiency for Telecommunication Equipment: Methodology for Measurement and Reporting DC Plant – Rectifier Requirements

(3) Normative References

[1] Method for determining normative references

The normative references were determined by calculating the equipment TEER and analyzing product trends.

【Normative References】

Single-phase AC100V input rectifier: TEER＝862

Single-phase AC200V input rectifier: TEER＝878

Three-phase AC200V/400V input rectifier (output power capacity of less than 5kW): TEER＝891

Three-phase AC200V/400V input rectifier (output power capacity of 5kW or more): TEER＝908

【Approximate Date for Achieving Normative References】

April 2012

[2] Assessment scale references

Set a threshold using the rate of reduction versus the power consumption at normative reference. In assessment scale, the rank including normative reference shall be ★★.

Use the applicable assessment scale standard for equipment that supports multiple inputs such as single-phase AC100V/200V common systems.

Single-phase AC100V input rectifier

Assessment Scale	Rate of reduction vs. power consumption at NR	Figure of Merit（TEER）
★★★★★	n≧45%	TEER≧919
★★★★	30%≦n＜45%	900≦TEER＜919
★★★	15%≦n＜30%	881≦TEER＜900
★★ (includes NR)	0%≦n＜15%	862≦TEER＜881
★	Normative reference not achieved	TEER＜862

Single-phase AC200V input rectifier

Assessment Scale	Rate of reduction vs. power consumption at NR	Figure of Merit（TEER）

★★★★★	n≧45%	TEER≧929
★★★★	30%≦n＜45%	911≦TEER＜929
★★★	15%≦n＜30%	894≦TEER＜911
★★ （includes NR）	0%≦n＜15%	878≦TEER＜894
★	Normative reference not achieved	TEER＜878

Three-phase AC200V/400V input rectifier (output power capacity of less than 5kW)

Assessment Scale	Rate of reduction vs. power consumption at NR	Figure of Merit（TEER）
★★★★★	n≧30%	TEER≧921
★★★★	20%≦n＜30%	911≦TEER＜921
★★★	10%≦n＜20%	901≦TEER＜911
★★ （includes NR）	0%≦n＜10%	891≦TEER＜901
★	Normative reference not achieved	TEER＜891

Three-phase AC200V/400V input rectifier (output power capacity of 5kW or more)

Assessment Scale	Rate of reduction vs. power consumption at NR	Figure of Merit（TEER）
★★★★★	n≧30%	TEER≧934
★★★★	20%≦n＜30%	925≦TEER＜934
★★★	10%≦n＜20%	916≦TEER＜925
★★ （includes NR）	0%≦n＜10%	908≦TEER＜916
★	Normative reference not achieved	TEER＜908

(4) Measurement Methodology

In light of the stipulations of ATIS, the following measurement conditions shall be used.

- Room temperature: 25℃±3℃
- Humidity: 30%-75%
- Error tolerance of measurement equipment: Use voltmeters, ammeters or wattmeters that have been calibrated.

Measurement precision:

Ammeters and voltmeters: within ±1%

Wattmeters: within ±1%.

- Voltage applied: Measure after applying single-phase 100V（±1%） or single-phase 200V（±1%）, three-phase 200V（±1%） or three-phase 400V （±1%） at a frequency of 50Hz（±1%） or 60Hz（±1%）.
- Preparations before measurement: Apply current equivalent to 100% of nameplate current to the module to be tested for at least 30 minutes before beginning measurements.

(5) Assessment Result and Assessment Scale Ranking

[1] Assessment result

The assessment result shall be the figure of merit actually measured by the vendor according to 5.2.6.2 (4) Measurement Methodology.

[2] Assessment scale ranking

The assessment scale ranking (★-★★★★★) shall be based on normative reference and assessment result.

[3] Variance in assessment result

Permissible variance due to differences in equipment (units) shall be determined in the future.

Until then, submit the average measurement value of the figure of merit determined by the vendor as the assessment result.

5.2.7 Server Equipment

5.2.7.1. Servers

The assessment standard for servers shall be different for active state and idle state in order to more accurately reflect actual operating conditions. The figure of merit specified by SPEC® (Standard Performance Evaluation Corporation) shall be applied as the assessment standard for active state. The top runner standard (2010 Ministerial Notification No. 74 from METI) shall be applied as the assessment standard for idle state.

(1) Definition

In this Guideline, a server is a computer device comprising of a central processing unit (CPU), a main memory, an input/output control and a power source. It is designed to exist as part of a network to provide information and services to other computer devices 24/7. It must be able to use an operating system (OS) so that it can be installed with and run user applications. Examples of servers include but are not limited to the following:

> file servers
> mail servers
> database servers
> authentication servers
> web servers
> media servers
> game servers

* Devices sold as a single unit which are actually a combination of hardware and software (such as appliances) shall be included under servers in this section if all that is needed to change the device to a particular use is the installation of (a) user application(s).

[Devices included in the scope above]

Devices which fall within the scope for assessment in active state are

categories H, I, J of the Energy Conservation Law and JVM (Java Virtual Machine) active equipment.

Devices which fall within the scope for assessment in idle state are all categories of the Energy Conservation Law (A – L).

Since the scope of equipment, figure of merit, normative reference, and measurement methodology for assessment standards for active state and idle states are different, they are noted separately below.

<<Assessment standard for active state>>

(2) Figure of merit

The figure of merit, SPECpower_ssj®, specified for servers by SPEC®[*1] shall be applied, and will be calculated as follows:

E=overall ssj_ops/watt=∑ssj_ops/∑power consumption (W)

ssj_ops is a metric for server processing capacity and is attained by implementing SPECpower_ssj®2008 v. 1.10 server power consumption performance benchmark test program by SPEC® to the servers included in the scope of the assessment. The performance (ssj_ops) at CPU load rates (0 – 100%) and average power consumption are measured, then the capacity (ssj_ops) at the respective target loads are totaled and divided by the total average power consumption (W) (∑ssj_ops/∑power), and that figure is considered to be the capacity metric (overall ssj_ops/watt) per electric power.

[*1] http://spec.org/power_ssj2008.

(3) Normative reference

[1] Method for determining normative references

A trend analysis of the product shall be conducted based on publicly disclosed SPEC® data.

[Normative reference]

E=1,000

[Approximate Date for Achieving Normative Reference]

The end of Fiscal Year 2010

[2] Assessment scale references

Set a threshold using the rate of reduction versus the power consumption at normative reference. In assessment scale, the rank including normative reference shall be ★★.

Assessment	Rate of reduction vs.	Energy efficiency ratio E per category

scale	power consumption at NR	H, I, J	A – G, K, L
★★★★★	n≧60%	E≧2,500	TBD
★★★★	40%≦n<60%	1,666≦E<2,500	
★★★	20%≦n<40%	1,250≦E<1,666	
★★ (includes NR)	0%≦n<20%	1,000≦E<1,250	
★	(Normative reference not achieved)	E<1,000	

(Note) Comparison of the rate of reduction against power consumption at normative reference among equipment with similar processing capacity (∑ssj_ops value).

[Formula for calibrating the threshold]
20% reduction: E/0.8=1,250
40% reduction: E /0.6=1,660
60% reduction: E /0.4=2,500

(4) Measurement methodology

[1] Measurement methodology

The server power consumption performance benchmark testing program, SPECpower_ssj®2008 v1.10, provided by SPEC® shall be used. For details, refer to the following sites (*2).

*2: SPEC® User Guide
http://www.spec.org/power_ssj2008/docs/SPECpower_ssj2008-User_Guide.pdf

[2] Measurement conditions

Measurements shall be taken in compliance to the SPEC® measurement conditions (*1, *2). For areas not covered by SPEC®, the following criteria shall be applied, taking into consideration the equipment's use in Japan.

Temperature: 25℃±5℃
Humidity: 30% - 75%
Voltage: -53VDC±5%, 100V±5% (50/60Hz±5%), 202V±5% (50/60Hz±5%)
Furthermore, measurements shall be taken in steady-state.

(5) Assessment Result and Assessment Scale Ranking

[1] Assessment result

The assessment result shall be the figure of merit actually measured by the vendor according to 5.2.7.1(4) Measurement Methodology. Furthermore, if the equipment is already registered with SPEC®, use the same values as the registered values.

[2] Assessment scale ranking

The assessment scale ranking (★-★★★★★) shall be based on normative

reference and assessment result.

[3] Variance in assessment result

Based on SPEC® measurement methodology, this Guideline does not specify permissible variance.

<< Assessment standard for idle state>>

(6) Figure of merit

Adopt the assessment standard based on the top runner method for computers (2010 Ministerial Notification No. 74 from the Ministry of Economy, Trade and Industry), which are specified equipment in the Energy Conservation Law. Normative reference and assessment scale are to be determined.

Figure of merit E = {(W1+W2)/2}/Q

In this equation, E, (W1+W2)/2, W1, W2 and Q shall indicate the following values:

E: energy efficiency ratio (W/giga calculations)

(W1+W2)/2: power consumption (W)

W1: power consumption in idle state (W)

W2: power consumption in low-power mode (W)

Q: theoretical operation (unit: giga calculations)

(Note) For computers without low-power mode, W2 and W1 are the same value.

(7) Normative References

[1] Method for determining normative references

Adopt the assessment standard based on the top runner method for computers (Type: server type computers), which are specified equipment in the Energy Conservation Law.

【Normative References】

Specific normative references are as follows:

Category				Energy conservation efficiency (W/GTOPS)
CPU Type	No. of I/O slots	No. of CPU sockets	Category name	
Dedicated CISC	n<32		A	1,950
	n≧32		B	2,620
RISC	n<8		C	13
	8≦ n<40		D	31
	n≧40		E	140
IA64	n<10		F	6.2
	n≧10		G	22
IA32	0		H	1.3

	1≦n<7	n<2	I	1.2
		2≦n<4	J	1.9
		n≧4	K	6.7
	n≧7		L	7.4

【Approximate Date for Achieving Normative References】
End of Fiscal Year 2011

[2] Assessment scale references

Set a threshold using the rate of reduction versus the power consumption at normative reference. In assessment scale, the rank including normative reference shall be ★★.

Assessment scale	Rate of reduction vs. power consumption at NR	Energy efficiency per category En (W/GTOPS)	Notes
		All categories（A-L）	
★★★★★	n≧60%	En≦E×0.4	See the aforementioned Normative References Table for E (W/GTOPS) Normative References
★★★★	40%≦n＜60%	E×0.4<En≦E×0.6	
★★★	20%≦n＜40%	E×0.6<En≦E×0.8	
★★ (includes NR)	0%≦n＜20%	E×0.8<En≦E	
★	Normative reference not achieved	E<En	

(8) Measurement Methodology

Measurement conditions are as follows, taking into account the substance of the 2010 Ministerial Notification No. 74 from the Ministry of Economy, Trade and Industry, which sets forth judgment standards for manufacturers of computers per the stipulations of the Energy Conservation Law.

[1] Power consumption in an idle state shall be power consumption while in a state where there is an electrical connection to the main power source and it is possible to operate without resetting the initial program, but before moving into a lower power consumption mode such as stand-by mode or suspend mode per ACPI standards, and shall be expressed in watts and measured using the following methodology.
[2] Peripheral temperature shall be 16℃-32℃.
[3] Power source voltage shall be within ±10% of rated input voltage. However, for equipment having a rated input voltage of 100V, power source voltage shall be 100V±10%.
[4] Power source frequency shall be rated frequency.
[5] Measure the maximum configuration with all detachable equipment, such as I/O control devices, communications control devices and a

magnetic disc devices that can be detached from the computer without impeding the basic functions of the computer excluded. However, for equipment where the number of processors is scalable, take measurements using the minimum possible number of processors.

(9) Assessment Result and Assessment Scale Ranking

[1] Assessment result

The assessment result shall be the figure of merit actually measured by the vendor according to 5.2.7.1(8) Measurement Methodology.

[2] Assessment scale ranking

The assessment scale ranking (★-★★★★★) shall be based on normative reference and assessment result.

[3] Variance in assessment result

With the announcement of 2010 Ministerial Notification No. 74 from the Ministry of Economy, Trade and Industry, this Guideline does not specify permissible variance.

5.2.8. Storage Equipment

5.2.8.1. Storage Equipment

(1) Equipment Definition

Storage equipment under this guideline shall be storage equipment having multiple disc drives, comprising of a magnetic disc control unit and a magnetic disc device, and is used with mainframe or other servers as an external memory device.

However, this guideline does not apply to storage equipment having a maximum data transmission speed of more than 270 GB per second.

(2) Figure of Merit

Adopt the top runner standard (2010 Ministerial Notification No. 75 from the Ministry of Economy, Trade and Industry) for magnetic disc devices (Type: subsystems), which are specified equipment in the Energy Conservation Law. The specific figure of merit is as follows.

Figure of Merit: E= Power consumption （W）/Storage capacity※（GB）

※: Maximum amount that can be physically stored to memory. For dedicated mirroring systems, redundant sub systems and disc arrays, include the storage capacity in the mirrored portion, the replicated portion of the redundant sub system and the redundant portion of the disc array.

(3) Normative References

[1] Method for determining normative references

Adopt the top runner standard for magnetic disc devices (Type: subsystems), which are identified as specified equipment in the Energy Conservation Law.

The specific figure of merit is as follows.

【Normative References】

Energy efficiency ratio (E), which is the normative reference, differs per category, and is expressed in the equation with the number of revolutions (N) indicated as a variable.

Specific normative references are as follows.

Category	Equipment/Application	Normative References
M	For mainframe servers	E=exp(1.85*ln(N)-18.8)
N	For uses other than mainframe servers	E=exp(1.56*ln(N)-17.7)

Examples of normative references by rpm

・For mainframe servers

7,200 rpm: 0.094
10,000 rpm: 0.18
15,000 rpm: 0.37

・For uses other than mainframe servers

7,200 rpm: 0.022
10,000 rpm: 0.036
15,000 rpm: 0.068

【Approximate Date for Achieving Normative References】

End of Fiscal Year 2011

[2] Assessment scale references

Set a threshold using the rate of reduction versus the power consumption at normative reference. In assessment scale, the rank including normative reference shall be ★★.

Assessment scale	Rate of reduction vs. power consumption at NR	Energy consumption efficiency En	Notes
★★★★★	n≧60%	En≦E×0.4	Normative references E (W/GB) are based on the table under (3) Normative References.
★★★★	40%≦n＜60%	E×0.4<En≦E×0.6	
★★★	20%≦n＜40%	E×0.6<En≦E×0.8	
★★ (includes NR)	0%≦n＜20%	E×0.8<En≦E	
★	Normative reference not achieved	E<En	

(4) Measurement Methodology

Measurement conditions are as follows, taking into account the substance of the 2010 Ministerial Notification No. 75 from the Ministry of Economy, Trade

and Industry, which sets forth judgment standards, among other things, for manufacturers of computers per the stipulations of the Energy Conservation Law.

The energy consumption efficiency of storage equipment is the power consumption measured using the following methodology and expressed in watts divided by storage capacity expressed in Gigabytes. However, in cases where actual measurement is difficult, the value may be calculated using a formula.

[1] Peripheral temperature shall be 16℃-32℃.

[2] Power source voltage shall be within ±10% of rated input voltage. However, for equipment having a rated input voltage of 100V, power source voltage shall be 100V±10%.

[3] Power source frequency shall be rated frequency.

[4] For subsystems, take measurements with the necessary amount of power to operate the control device, buffer cache memory and a magnetic disc device, as well as the maximum number of disc drives that can be connected to the control device, in addition to the maximum number of I/O signal transmission lines.

[5] Take measurements with the equipment power on, with the disc spinning and in a state capable of immediately writing or reading data.

(5) Assessment Result and Assessment Scale Ranking

[1] Assessment result

The assessment result shall be the figure of merit actually measured by the vendor according to 5.2.8.1(4) Measurement Methodology.

[2] Assessment scale ranking

The assessment scale ranking (★-★★★★★) shall be based on normative reference and assessment result.

[3] Variance in assessment result

With the announcement of 2010 Ministerial Notification No. 75 from the Ministry of Economy, Trade and Industry, this Guideline does not specify permissible variance.

5.3 Implementation

5.3.1 Public disclosure of assessment results of energy-saving equipment and target timeline for disclosure

Vendors wishing to submit their energy-saving equipment to the Council shall measure and assess the equipment in compliance to criteria outlined in 5.2 of this Guideline, submit the assessment results and other pertinent information (normative reference and assessment scale ranking) to the Council, and publicly

disclose information via such medium as the Council website. In principle, only vendors can make submissions and the Council will not accept submission of assessment results from third parties. Indication of the assessment outcome in the vendor's website or other medium, such as the vendor catalog is left to the discretion of the vendor.

Furthermore, the target timeline for public disclosure of the assessment outcome shall be December 27, 2010 or later.

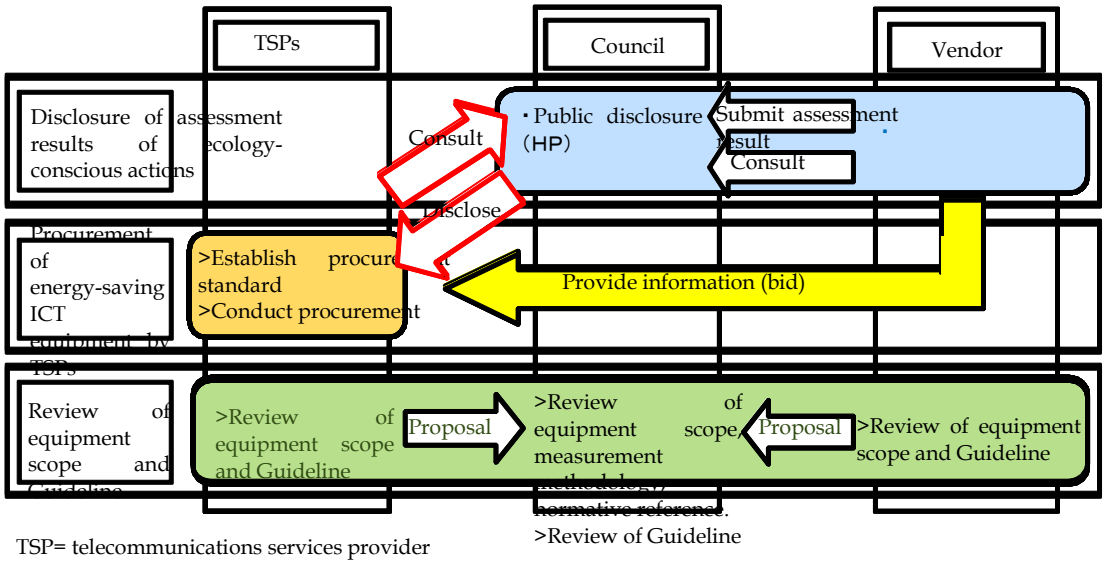
5.3.2 Procurement of energy-saving equipment by telecommunications services providers

Telecommunications services providers planning to procure energy-saving equipment shall establish a procurement standard based on this Guideline and the assessment outcome of energy-saving equipment publicly disclosed on the Council's website and other medium.

5.3.3 Addition of new equipment and review of the existing Guideline

Telecommunications services providers and vendors shall propose the addition of new equipment to be covered in the scope of the Guideline or a review of existing standards based on product trends, such as the emergence of new functions. Upon receipt of a proposal, the Council shall decide on the addition of the indicated equipment, the measurement methodology, normative reference, and the timing of implementation for the new criteria. In addition, the Council shall review the Guideline as deemed appropriate.

For example, a review of the figure of merit will be necessary with the addition of a new function (optical XC or packet switching for WDM equipment), or when a new format is announced (10G-PON for GE-PON equipment), or a new equipment which is not covered by existing definitions is announced.



TSP= telecommunications services provider

Image of implementation of assessment standard for equipment

Step 1: Assessment outcome information shall be provided to telecommunication services providers, member organizations and companies of the Council, government offices, universities and research organizations (December 27, 2010 or later).

Step 2: Assessment outcome information shall be made available with no restrictions (target summer 2011 and to be determined based on various considerations).

6. Normative Reference for Data Centers

6.1 Basic Approach to Normative Reference

A data center is a complex facility combining ICT equipment such as servers, storage equipment, and network equipment with other hardware including air conditioning systems and power converters. Additionally, the various modes of use and contractual agreements that exist contribute to a multifaceted situation. Furthermore, in terms of services, data centers perform a variety of work and individual data centers differ greatly in how and for what processes software is used.

For this reason, establishing a figure of merit on energy-saving as a normative reference for data centers is no easy task. Studies on this issue are currently underway inside and outside of Japan. Therefore, this guideline uses PUE as one figure of merit (details to follow) currently accepted on a wide scale, which serves as a useful reference for data centers to perform CO_2 emission reduction activities and for telecommunications services providers to procure data center services. Even in the case of PUE, which has been adopted on a relatively broad scale, there is insufficient data from actual measurements and little data has been publicly

disclosed. Therefore, to promote telecommunications service providers' CO_2 emission reduction activities, it is hoped that data center operators measure energy conservation related data (e.g. PUE with clear measurement conditions) and make further efforts in public disclosure.

Unresolved challenges have been identified, such as the need for further consideration of data center processing performance; for this reason, this Guideline will continue to revisit figures of merit in consideration of future trends and issues inside and outside of Japan.

6.2 Definition

A data center is a space or facility (including air conditioning, power converters, etc.) used exclusively to store the ICT equipment (network equipment, servers, storage equipment, etc.) it operates.

A data center may be a stand-alone building but also could occupy a portion of space in a shared facility (office, etc.) within a building used for other purposes.

However, this guideline covers data centers primarily providing services to external clients. Thus, this guideline does not apply to a small-scale server room equipped with only a few pieces of ICT equipment.

6.3 Figure of Merit on Energy-Saving As a Normative Reference

(1) The current situation of figure of merit on energy-saving

As described above, figures of merit on energy-saving as normative reference for data centers are currently under study inside and outside of Japan. Defining energy efficiency of data centers is quite difficult and nothing that may be used as a figure of merit that has been adopted on a global scale exists at the present time.

Figure of merit on energy-saving may be categorized into the following two types: using one figure of merit to represent the data center as a whole or using multiple metrics as a set to represent the multifaceted aspects of data centers. For example, in the case of the former, an energy productivity figure of merit (a ratio of the amount of energy introduced to the data center versus the work processed by the data center) is currently under study. No clear definition has been established, however, as details are still under study inside and outside of Japan.

(2) Figure of merit on energy-saving that may be used now

One figure of merit on energy-saving for data centers that may be used now is the Power Usage Effectiveness (PUE) figure of merit, which compares the power consumption of the ICT equipment that should be in operation to the power consumption of the facility portion (air-conditioning, power source, lighting, etc.) used to operate the ICT equipment. PUE is a figure of merit proposed by The Green Grid (US) and its definition is as follows.

PUE = power consumption of entire facility (ICT equipment + facilities) / power consumption of ICT equipment

Based on this definition, one could say that a small PUE value could mean that the facilities portion of a data center has good energy efficiency.

The inverse of PUE is the Data Center Infrastructure Efficiency (DCiE). Presumably, these two metrics could be used in parallel depending on their application, such as the method of managing the figures.

PUE and DCiE are the figures of merit on energy-saving for data centers most widely adopted so far.

At the same time, there are those who point to issues with PUE and DCiE. One is that the measurement methods are not always clearly defined. Another is that the metrics do not consider differences in energy efficiency derived from efficiency of the ICT equipment and operational proficiency.

(3) The status of studies at related organizations

In light of the current issues with PUE, The Green Grid and many other organizations are studying the development of better figures of merit on energy-saving.

The Green Grid is studying measurement guidelines, numerical reporting and a certification system for PUE. Additionally, The Green Grid is involved in developing the Data Center energy Productivity (DCeP) metric for representing the energy productivity of the entire data center, including not only facilities but also ICT equipment, and an applicable alternative figure of merit (proxy).

Also, Japan's Green IT Promotion Council has entered into an MOU with The Green Grid to pursue the development of an independent figure of merit on energy-saving covering the entire data center including ICT equipment.

Moreover, under the EU's Code of Conduct on Data Centers, a guideline compiled for data centers, PUE is adopted as a figure of merit on energy-saving for facilities, while a productivity figure of merit is to be decided in consideration of future trends. Furthermore, the US Environmental Protection Agency (USEPA) uses Energy Usage Effectiveness (EUE: a ratio similar to PUE, but calculated using a supply-side energy conversion) and, has also begun activities so as to rate the energy efficiency of facilities.

(4) Data Center Figure of Merit on Energy-Saving under this Guideline

In light of current studies on figures of merit on energy-saving and the situation of global adoption, this Guideline preliminarily uses PUE, already adopted as a figure of merit on energy-saving for the facilities portion, which serves as a useful reference for data centers to perform CO_2 emission reduction activities and for telecommunications service providers to procure data center services. It is preferred that data center operators measure energy conservation related data (e.g. PUE with clear measurement conditions) and advance public disclosure. This

guideline will continue to revisit figures of merit in consideration of future trends in studies on the issues inside and outside of Japan.

6.4 Outline of Figure of Merit on Energy-Saving

(1) PUE and DCiE

PUE, currently an important figure of merit on energy-saving for data centers, is as described in 6.3(2), and its inverse is DCiE (DCiE = 1/PUE).

Here, ICT equipment includes computers, network equipment, ICT support systems (printers, etc.), storage, and telecommunications equipment. Facilities refer to equipment not included under ICT equipment, namely, electrical power (converters, UPS, lighting, etc.), air conditioning (including cooling tower, cooling water pump, humidifier, etc.), security equipment, building management systems and the like. DCiE is simply the inverse of PUE; thus, articles subject to measurement are the same in both cases.

In the case that a data center uses other energy sources in parallel to electrical power, use an energy conversion value to calculate PUE or DCiE. Specifically, use a crude oil equivalent value for the amount of energy consumed as defined by the Energy Conservation Law.

(2) Measurement Methods for PUE and DCiE

A guideline set forth by The Green Grid exists for PUE and DCiE measurement methods (measurement frequency, selecting measurement points, etc.). The guideline indicates three levels (1 to 3). (For details see The Green Grid White Paper Number 14 The Green Grid metrics: A detailed analysis of DCiE (Data Center Infrastructure Efficiency).)

http://members.thegreengrid.org/japanese/gg_content/White_Paper_14_-_DCiE_Detailed_Analysis_11.06.08_JP.pdf)

(3) PUE and DCiE Measurement Results to be Disclosed and Methodology

The energy efficiency of data centers is believed to differ depending on the characteristics of the data center. Thus, in disclosing figures of merit on energy-saving such as PUE or DCiE, the basic characteristics of a data center that would significantly impact energy efficiency need also be disclosed. As an attempt at tentative uniformity in consideration of user convenience, specific disclosure items should include, in addition to the actual PUE measurement values, measurement methodology, data center location, room temperature and humidity settings, duration of measurement, and redundancy configurations.

This guideline will not stipulate uniform measurement methods, but the measurement methods (measurement frequency, measurement sites, etc.) used by the data center should be disclosed.

Furthermore, The Green Grid has published a guideline* on the disclosure of PUE measurement values. Refer to the following table for additional information specified by the Council.

In addition, items to be disclosed shall be added or change as deemed necessary.

* The Green Grid's White Paper #22, "Usage and Public Reporting Guidelines for the Green Grid's Infrastructure Metrics (PUE/DCiE)" is available at the following URL:
http://www.thegreengrid.org/~/media/WhitePapers/White%20Paper%2022%20%20PUE%20DCiE%20Usage%20Guidelinesfinalv21.ashx?lang=en

Disclosure item		Example of Disclosure
Actual PUE measurement values (average/highest/lowest)		1.86/2.08/1.69
Measurement methodology	Measurement frequency	once weekly
	Measurement points	ICT equipment power consumption: UPS Power consumption of entire facility: data center power supply input
	Duration of measurement	October 2007 to September 2008
Basic Characteristics	Data center location	Country, area (Kanto, etc.))
	Room temperature and humidity settings	22℃/50-60%
	Redundancy configuration	N+1

PUE disclosure items

6.5 Implementation (See 4.3 (1) diagram)

6.5.1 Disclosure Method of Energy Conservation Related Data of Data Center

Data center operators shall report energy conservation related data (e.g. PUE with clear measurement conditions etc.) to the Council and disclose that information via such medium as the Council's website. (PUE measurement results to be disclosed in accordance with the disclosure items set forth in 6.4(3))

Furthermore, an outline of energy-saving efforts by data centers may be submitted to the Council, and any submitted information will be publicly disclosed via the Council website, or other medium.

Refer to the separate Council instructions concerning disclosure methodology for specific energy saving data and other information on data centers.

6.5.2 Procurement by Telecommunications Service Providers of Data Center Services

Telecommunications services providers seeking to procure data center services shall refer to energy conservation related data of the data center disclosed in this guideline, on the Council's website and the like to formulate their procurement standards, and procure the services by selecting a data center based on a comprehensive assessment together with required functions and processing performance.

7. Assessment Standard Eco ICT Logo

7.1 Purpose

7.1.1 Purpose of Self-Assessment of Efforts

The status of efforts and achievements in reducing CO_2 emissions made by telecommunications service providers needs to be publicly disclosed (made visible) in an appropriate and timely fashion so that external parties including users and other related parties may appropriately assess such efforts.

In light of such needs, the purpose of these endeavors is to encourage telecommunications services providers to check the status of those efforts under their own initiative and to enhance their efforts to be ecologically conscious and to reduce their burden on the environment.

7.1.2 Indication of Eco ICT Logo

Telecommunications services providers shall display the "Eco ICT Logo" as a medium for broad public disclosure depending on the result of appropriate self-assessment of their actions to reduce CO_2 emissions etc. and to indicate the status of such implemented actions.

The following entities may display the "Eco ICT Logo:"

> Telecommunications services providers.

> A person who operates a telecommunications business defined under the Telecommunications Business Act, other than Telecommunications services providers.

> Neither of the above, but operating business related to telecommunications services using substantial ICT equipment AND recognized by the Council.

7.2 Checklist

7.2.1 Purpose of the Checklist

The Council has prepared the Self-Assessment Checklist for CO_2 Emission Reduction Efforts by Telecommunications Services Providers (hereinafter, the Checklist) (see separate sheet) for telecommunications services providers to set targets for reducing CO_2 emissions and to use the checklist for self-confirmation and make their efforts visible to others.

The purpose is for telecommunications services providers to use this checklist to perform self-assessments of the results of actions plans prepared and implemented by individual companies and as a medium for public disclosure.

7.2.2 Checklist Assessment Items and Assessment Standards

<Preparation of a Voluntary Ecological Action Plan>

[1] Has a voluntary ecological action plan stipulating various efforts directed at reducing CO_2 emissions been created and is it being executed?
- Is there a voluntary ecological action plan in place, which is aimed at promoting ecological preservation activities such as the prevention of global warming, reduction of waste and the promotion of reduce, reuse and recycling activities?

[2] Does the ecological policy include specific efforts stipulating numerical targets for the reduction of CO_2 emissions?
- Does the voluntary ecological action plan include specific activities and numerical targets?

Examples
- Reduce by the end of 2020 the amount of electricity used by ICT equipment by 25%, compared to 1990 levels.
- Switch to green power generation, purchase green power certificates and the like, so that green power accounts for 10% of electricity used.
- 10% reduction on a year-to-year base employees' use of private vehicles for commuting by promoting the use of public transportation, bicycles and car-sharing.

[3] Is the ecological policy documented and disseminated inside and outside the company? Does the company carry out activities to inform and enlighten its employees? Is the company working to raise ecological awareness?
- Are employees informed of such plans through internal training events and the like?
- Is information disclosed outside the company or is information disclosed to interested parties and other members of the general public when needed?

[4] Does the company disclose to the general public its activities and data such as CO_2 emission reduction?
- Is such information as progress reports, accomplishments and track record of specific activities under the voluntary ecological action plan disclosed to the public?
- Does that information continue to be publicly disclosed based on annual reviews?

*May be substituted with the creation and disclosure of an ecological report, CSR report, sustainability report, and the like.

Examples
- URL of the company's website where the status of specific actions taken in accordance with the voluntary ecological action plan is disclosed
- URL of the company's blog where information on ecological activities is disseminated on a continual basis

<Efforts Related to Procurement>

[5] In regard to ICT equipment and data center services, has the company prepared a procurement standard that takes energy conservation into consideration? Is procurement carried out in accordance with the standard?
- Is there a procurement standard prepared in reference to this Guideline that relates to ICT equipment and data center functions the company plans to procure?
- Are ICT equipment and data centers with advanced energy conservation features being procured in accordance with an established procurement standard?

[6] Is the company cognizant of energy conservation in procuring office equipment, supplies and logistics (e.g., green purchasing)?
- Is the company implementing green purchasing?
- Are specific procurement measures taken in consideration of energy conservation?

Examples
- Introducing fluorescent lamps and office equipment with low power consumption.
- Prioritize procuring products and services minimizing burden on the environment from providers who make an effort to lower negative environmental impact.

<Promotion Regime>

[7] In relation to efforts to reduce CO_2 emissions, has the company assigned a person or department to be responsible for such matters?
- Has the company assigned a person or department to be responsible for promoting these efforts, regardless of whether those resources are dedicated or hold other concurrent responsibilities?

[8] Is there a regime in place using internal audits or other means to keep appropriate track of the implementation of measures and achievement of targets set forth in the voluntary ecological action plan? Is the internal audit performed by a department other than the department that sets targets?
- Are member companies of industry groups auditing each other?
- Or does the company receive external audits or comments from third parties?

Examples
- Member companies of industry groups audit each other.

<Other Ecological Activities>

[9] Are ecologically-friendly efforts being made other than activities to save energy?

- Is the company involved in resource conservation in the office by conducting double-sided printing or printing on the flip side of already printed paper and trying to reduce waste? If so, specific activities shall be indicated.

Examples

- Working to use double-sided printing and copying, reduce the amount of paper and ink used, and reduce the amount of power used for printing.
- Working to decrease the number of pages printed by not printing out unnecessary pages.

[10] Is the company involved in ecological preservation activities in collaboration with local communities?

- Does the company work on a continual basis with society on activities related to ecological preservation?

Examples

- Work jointly with regional organizations every month to pick up garbage and increase plant coverage in local areas.
- Participate in community recycling activities to actively recycle.
- Participate in eco-cap activities and make contributions to society beyond recycling efforts.

7.2.3 Review of the Checklist

The Council shall review this checklist and its items as appropriate in response to: reviews of this Guideline; changes in policy relating to global warming measures; revisions to laws and ordinances; the status of ICT service provision; penetration of equipment and the like; and technological advances.

7.3. Eco ICT Logo

7.3.1 Method of Indication

In accordance with 7.3.2, telecommunications services providers may use on their website and printed matter the name of the logo and the "Eco ICT Logo" set forth in the reference section of the Guideline.

7.3.2 Usage Stipulations

(1) Usage Standard

In using the name and "Eco ICT Logo," disclosure by the means set forth in 7.4.2 must be followed.

(2) How to Obtain

The "Eco ICT Logo" may be downloaded in electronic format from the Council's website.

(3) The permissible scope of use of the name and "Eco ICT Logo" by a

telecommunications services provider

- The company's website
- The company's advertisements requested to be posted on a third party's website
- E-mails sent by the company or by a third party at the request of the company
- Business cards
- Materials distributed in an electronic format
- Printed pamphlets, distribution materials, leaflets, mailings, etc.
- Projection data used in presentations

(4) Reminders in Use of Logo

When using the name and "Eco ICT Logo," telecommunications services providers shall do so under the following conditions.

[1] Expenses shall be borne by the telecommunications service provider.

[2] The name and "Eco ICT Logo" must be used in their entirety, without changing the aspect ratio or the color of the "Eco ICT Logo."

[3] When use of the name or the "Eco ICT Logo" by a telecommunications services provider might possibly conflict with the intent of self-assessment efforts to reduce CO_2 emissions or conflict with public order or standards of decency, or otherwise, the Council may advise the telecommunications services provider of correction based on a judgment by the Council.

(5) Discontinuing Use of the Logo

[1] In the event a telecommunications services provider using the name or "Eco ICT Logo" fails to perform self-assessment of efforts to reduce CO2 emissions, the telecommunications services provider must promptly discontinue use of the name and "Eco ICT Logo."

[2] In the event a telecommunications services provider does not comply with the stipulations under 7.3.2 and rules regarding usage separately set forth by the Council, the Council may remove the company from the Council's website and notify of the discontinuation of use of the name and "Eco ICT Logo."

7.4. Implementation

7.4.1 Assessment Methods

[1] The telecommunications services provider shall perform self-assessment based on the checklist as to whether the company is actively implementing efforts to reduce CO_2 emissions.

[2] If the telecommunications services provider is judged to be appropriately implementing efforts indicated in the checklist, the telecommunications services provider shall be responsible for describing an overview of specific

efforts being implemented in the checklist.

[3] Items 1 to 8 on the checklist are mandatory entries (must describe the company's efforts) and items 9 and 10 are recommended (free to list information in checklist or not).

[4] In the event certification of an international standard (ISO 14001) relating to environmental management systems has been acquired, companies may substitute check list entries as appropriate with an indication that certification has been acquired under the applicable assessment items and a description of where that information is made be publicly available.

7.4.2 Public Disclosure Methods by Telecommunications Services Providers Conducting the Efforts

The following information of telecommunications services providers involved in efforts complying with the checklist shall be publicly available through the Council's website.

- Company name (personal name or trade name if an individual)
- URL and link to where the checklist is posted

Telecommunications services providers need to disclose the completed checklist and provide sufficient information for a user or viewer to understand what sort of efforts was made that apply to or comply with the checklist per the self-assessment.

(1) Submitting Necessary Forms & Information

[1] Telecommunications services providers shall post the checklist prepared per 7.4.1(2) on their website and make a submission to the Council via the Council website.

[2] If a telecommunications services provider having information disclosed on the Council's website needs to revise targets aimed at reducing CO_2 emissions or change specific effort within the effective period of disclosure, the telecommunications services provider shall follow the procedures similar to those for the original Application as deemed appropriate via the Council website.

(2) Effective Period of Disclosure by the Council

[1] Regarding results of telecommunications services providers' specific efforts toward targets aimed at appropriately reducing CO_2 emissions, such targets need to be reviewed at least once a year, since continuity and improvement contributes greatly to reducing CO_2 emissions. Thus, the effective period of disclosure by the Council shall be no longer than one year and continue to the last day of December of each year.

[2] When self-assessment of efforts to reduce CO_2 emissions is performed, a checklist is completed and submitted at some point between January 1 and the last day of December. The effective period of disclosure by the Council shall continue until the last day of December of the year disclosure began

and shall not be calculated as one full year from the date of disclosure.

(3) Method of Renewing Public Disclosure by the Council

[1] Telecommunications services providers shall submit necessary information to the Council between October 1 and the last day of December of each year, receive confirmation for renewal and have disclosure by the Council renewed.

[2] For renewal, a telecommunications services provider submits procedures similar to those for the original report to the Council via the Council website.

[3] If a telecommunications services provider does not report for renewal by the last day of December each year, the Council may remove that company from the list and cancel the company's usage of the name and "Eco ICT Logo."

[4] Telecommunications services providers removed from the list disclosed by the Council must promptly discontinue use of the name and "Eco ICT Logo" on their own websites and printed mattes.

(4) Others

[1] If a third party inquires about the disclosed contents regarding a telecommunications services provider on the Council's website, the inquiry may be routed to the relevant telecommunications services provider.

[2] The telecommunications services provider subject to the inquiry must answer and respond in good faith.

Diagram of Logo for Reference

Eco ITC Logo design

Attachment 1

Self-Assessment Checklist for CO_2 Emission Reduction Efforts by Telecommunications Services Provider

Telecommunications services provider: _____

<Mandatory items>

		Assessment items	Implementation, measures taken
Preparation of a voluntary ecological action plan	1	Has a voluntary ecological action plan stipulating various efforts directed at reducing CO_2 emissions been created and is it being executed?	
	2	Does the ecological policy include specific efforts stipulating numerical targets for the reduction of CO_2 emissions?	
	3	Is the ecological policy documented and disseminated inside and outside of the company? Does the company carry out activities to inform and enlighten its employees? Is the company working to raise ecological awareness?	
	4	Does the company disclose to the general public its activities and data such as CO_2 emission reduction?	
Efforts relating to procurement	5	In regard to ICT equipment and data center services, has the company prepared a procurement standard that takes energy conservation into consideration? Is procurement carried out in accordance with the standard?	
	6	Is the company cognizant of energy conservation in procuring office equipment, supplies and logistics (e.g., green purchasing)?	
Promotion regime	7	In relation to efforts to reduce CO_2 emissions, has the company assigned a person or department to be responsible for such matters?	
	8	Is there a regime in place using internal audits or other means to keep appropriate track of the implementation of measures and achievement of targets set forth in the voluntary ecological action plan?	

<Recommended items>

Other ecological activities	9	Are ecologically-friendly efforts being made other than activities to save energy?	
	10	Is the company involved in ecological preservation activities in collaboration with local communities?	

8. Reference Material

8.1 List of Members of the ICT Ecology Guideline Council (2009)

Omitted.

8.2 List of Members of the ICT Ecology Guideline Council (2010)

Omitted.

(V20R11)