Revision to Notifications of the Ministry of Economy, Trade and Industry (METI) for the Act on the Rational Use of Energy

1. Back ground

   Under the Act on the Rational Use of Energy (Law No. 49 of 1979; hereinafter referred to as the "Energy Efficiency Law"), the Minister of Economy, Trade and Industry (METI) shall decide the standards of judgement for manufacturer and importer (hereinafter referred to as "manufacturer, etc.") in regard to improvement of the energy efficiency performance with respect to computers included in the energy consumption equipment which is specified in the Act (hereinafter referred to as "energy efficiency standards"). Moreover, METI shall decide requirements for indication of the information of energy consumption on catalog.

   Additionally, the energy efficiency standards shall be established taking consideration of the energy efficiency of the specified energy consumption equipment which has the highest energy efficiency and other related factors. (It is called the "Top Runner Program".)

   METI proposes a new energy efficiency standard for computers in order to promote rationalization of energy use pertaining to computers in Japan and disseminate energy efficient computers in order to cope with the recent increase of energy consumption, global warming problem and so forth.

2. Outline of amendment

   New energy efficiency standards are established for computers.

   (1) Target scope

      Server-type computers and client-type computers

   (2) Target fiscal year

      Target fiscal year is set to be FY2021 for server-type computers, and FY2022 for client-type computers.

   (3) Measurement method of energy consumption efficiency

      In the case of server-type computers, the value of energy consumption efficiency shall be obtained as a geometric average of each performance of CPU, memory and storage per power consumption, which is measured by method defined in SERT ver2.0.

      In the case of client-type computers, the value of energy consumption efficiency shall be obtained as the annual amount of energy consumption (kWh/year), which is measured by method defined in JIS C 62623:2014.

   (4)Target standard value

      In the case of server-type computers, the target standard value is set by the type of CPU and the number of CPU sockets.

      In the case of client-type computers, the target standard value shall be calculated by formulas of standard energy consumption efficiency which is set by the type of products, P score, screen size and cabinet body capacity. The formulas includes adding a TEC (Typical Electricity Consumption) correction value which increment TEC in accordance with additional functions of products.

Table 1: Server-type computers

CPU type	No. of CPU sockets	Category name	Standard energy consumption efficiency
x86	1	A	8.9
	2	B	11.9
	4	C	8.9
SPARC	1	D	6.3
	2	E	4.2
	4	F	3.5
Power	1	G	4.6
	2	H	4.9
	4	I	4.2

Remarks 1. "Server-type computer" refers to a computer that is designed to operate 24 hours a day and provide services on a network, and which can be accessed only via the network.

2. "x86" refers to CPUs, designed to be able to execute multiple commands differing in number of bits and having a 64-bit architecture compatible with the 32-bit architecture.

3. "SPARC" refers to CPUs other than ones designed to be able to execute multiple commands differing in number of bits, with both the decimal floating point operation and the register-window mechanism.

4. "Power" refers to CPUs other than ones designed to be able to execute multiple commands differing in number of bits, with the decimal floating point operation but with no register-window mechanism.

Table 2: Client-type computers

Type of computer	Performance of CPUs [P score]	Screen size	Cabinet body capacity	Category name	Standard energy consumption efficiency (kWh/year)
Notebook computers	8 less than	15inch less than	—	J	$E = 5.21 + TEC_{MEMORY} + TEC_{INT\_DISPLAY} + TEC_{STORAGE} + TEC_{GRAPHIC}$
		15 inch or more	—	K	$E = 7.75 + TEC_{MEMORY} + TEC_{INT\_DISPLAY} + TEC_{STORAGE} + TEC_{GRAPHIC}$
	8 or more	—	—	L	$E = 11.34 + TEC_{MEMORY} + TEC_{INT\_DISPLAY} + TEC_{STORAGE} + TEC_{GRAPHIC}$

Desktop Computers	Integrated	8 less than	—	—	M	$E=39.87+TEC_{MEMORY}+TEC_{INT\_DISPLAY}+TEC_{STORAGE}+TEC_{GRAPHIC}$
		8 or more	—	—	N	$E=53.32+TEC_{MEMORY}+TEC_{INT\_DISPLAY}+TEC_{STORAGE}+TEC_{GRAPHIC}$
	Separated	—	—	5 liter less than	O	$E=29.59+TEC_{MEMORY}+TEC_{STORAGE}+TEC_{GRAPHIC}$
		—	—	5 liter or more, but less than 20 liter	P	$E=31.33+TEC_{MEMORY}+TEC_{STORAGE}+TEC_{GRAPHIC}+TEC_{POWER}$
		—	—	20 liter a or more, but less than 35 liter	Q	$E=28.45+TEC_{MEMORY}+TEC_{STORAGE}+TEC_{GRAPHIC}+TEC_{POWER}$
		—	—	35 liter or more	R	$E=40.47+TEC_{MEMORY}+TEC_{STORAGE}+TEC_{GRAPHIC}+TEC_{POWER}$

Remarks 1 "P score" refers to Performance Score, represent the following values.

P=[the number of CPU cores] × [CPU clock speed (GHz)], where "the number of cores" represents the number of physical CPU cores and "CPU clock speed" represents the Max TDP (thermal design power consumption) , not the turbo boost frequency.

2 "Screen size" refers to the centimeter-denominated quotient, rounded at one digit below the decimal point, of division of the diagonal outer dimension of the display area of the display screen by 2.54.

3 " Cabinet body capacity " is a capacity of electronic components that houses parts of the hardware together in terms of the capacity L (liter) of the case to be kept.

4 E represents the following values.

E: Standard energy consumption efficiency (kWh/year)

5 TEC_{MEMORY}, $TEC_{INT\_DISPLAY}$, $TEC_{STORAGE}$, $TEC_{GRAPHIC}$ and TEC_{POWER} are TEC correction value shown in the following.

TEC_{MEMORY}: TEC correction value for main memory (kWh/year)

$TEC_{INT\_DISPLAY}$: TEC correction value for display (kWh/year)

$TEC_{STORAGE}$: TEC correction value for additional internal storage element (kWh/year)

$TEC_{GRAPHIC}$: TEC correction value for the discrete GPU (kWh/year)

TEC_{POWER}: TEC correction value on power supplies (kWh/year)

Table 3: TEC correction value (kWh/year)

Category name	TEC correction value						
	Maximum main memory capacity	Display		Additional Internal Storage element			Discrete GPU	Power supplies
		17.4 inch less than	17.4 inch or more	SSD	2.5 HDD	3.5 HDD		
J	[GB]×0.186	(8.76×0.30)×(viewable screen area [inch²]×0.0300 + screen resolution [M-pixel]×0.244)		0	2.510	—	4.198	—
K								—
L								—

M	[GB]×0.248	(8.76×0.35)×(viewable screen area [inch²]×0.0300 + screen resolution [M-pixel]×0.244)	(8.76×0.35)×(viewable screen area [inch²]×0.0393)		3.140	20.380	0.587×FB_BW [GB/s] + 30.463 ※Up to 130	–
N								–
O		–	–					–
P		–	–					Rated input power×0.0543 [W]
Q		–	–					
R		–	–					

Remarks 1 "Maximum main memory capacity" refers to the maximum memory capacities excluding cache memory capacities. (unit: GB)

2 "Viewable screen area" refers to the value obtained by dividing the diagonal outer diameter dimension of the display screen in centimeters by 2.54 to decimal point, and the value obtained by squaring the numerical value rounded off to the second place or less. (unit: inch²)

3 "Screen resolution" refers to the total number of pixels displayed on the screen.(unit: megapixel).

4 "Additional internal storage element" refers to storage element which is incorporated in SSD or 2.5 inch HDD or 3.5 inch HDD.

5 "the discrete GPU (Graphics Processing Unit)" refers to a processor having image data processing dedicated local memory. The performance of the stand-alone GPU is expressed by displaying FB_BW (frame buffer bandwidth). The frame buffer bandwidth is a memory area for temporarily storing image data to be displayed on the screen (unit: GB/s).

6 "Power supplies" refers to the rated input of the internal power supplies (unit: watts).

(5) Standard method

In regard to server-type computers which manufacturer, etc. would ship for Japanese market in each fiscal year since target fiscal year, weighted average value of calculated energy consumption efficiency by the volume of shipments of each manufacturer, etc. in each division shall not fall below the target standard value.

In regard to client-type computers which manufacturer, etc. would ship for Japanese market in each fiscal year since target fiscal year, weighted average value of calculated energy consumption efficiency by the volume of shipments of each manufacturer, etc. in each division shall not exceed the target standard value corrected according to the specification of computers.

(6) Labelling requirement

Manufacturer, etc. shall indicate energy consumption efficiency, etc. of these products on catalogs or documents which is provided to consumers.

3. Proposed date of entry into force

Around spring of 2019.