Reduction of Environmental Burden by Environmentally Conscious Solutions

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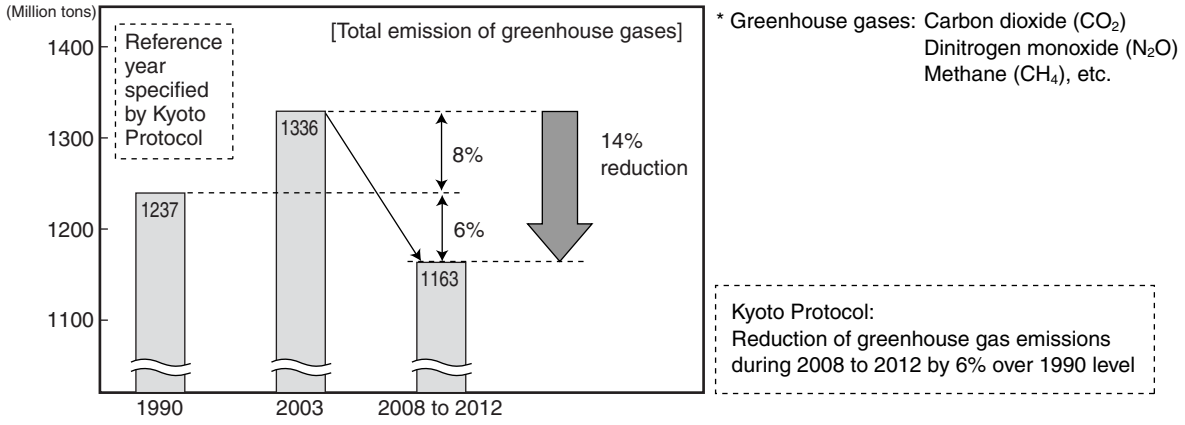
Around the world, Fujitsu has provided high-performance, high-quality products and solutions based on its strong capabilities in information and communication technology (ICT). The Solution Business Support Group of Fujitsu has developed an environmental burden assessment method and certified solutions that meet certain environmental burden reducing standards as "Environmentally Conscious Solutions." This department offers such solutions together with ICT products with the aim of helping customers and communities reduce the environmental burden and increase environmental efficiency. Introducing ICT in an enterprise can generally minimize the transportation of people and goods and the use of paper and other materials, resulting in a reduction in total cost of ownership (TCO) and an improvement in management efficiency. Because of these environmental benefits of ICT, the Solution Business Support Group has started a certification system based on a quantitative environmental burden assessment method and is extending this system to all of its domains.

1. Introduction

In December 1997, the Third Conference of the Parties (COP3) to the United Nations Framework Convention on Climate Change (UNFCCC) took place in Kyoto, Japan and adopted targets for developed countries to reduce their emissions of greenhouse gases. The general framework defined at this conference is commonly known as the Kyoto Protocol. Eight years later, on February 16, 2005, the Kyoto Protocol entered into force, and the countries that ratified the treaty began taking active steps toward preventing global warming. The protocol requires Japan to reduce its emission of greenhouse gases by 6% from the level of the 1990 reference year. However, according to the report for fiscal 2003, the Japanese emission of greenhouse gases has actually increased and the country now needs to achieve a 14% reduction (**Figure 1**).

Fujitsu has declared its promotion of environmental activities in an action guideline called "The FUJITSU Way" and shared an eco-friendly concept under the slogan of "We make every activity green." Fujitsu's Solution Business Support Group has provided customers with total business solutions, including the introduction of information and communication technology (ICT) products, services, and system operations, with the aim of helping customers and communities reduce the environmental burden and increase environmental efficiency. This Group has focused attention on the fact that introducing an ICT solution in an enterprise can also effectively reduce the environmental burden and has recently developed an environmental burden assessment method to quantitatively measure how much an ICT solution reduces the environmental burden. This Group has also established an in-house system for certifying solutions that meet certain burden reducing standards as environmentally



Source: Ministry of the Environment.
http://www.env.go.jp/

Figure 1
Kyoto Protocol and Japan's target.

conscious solutions.

We intend to certify a total of 90 solutions by the end of fiscal 2006 and are providing our customers with clarified and detailed information about how certified ICT solutions contribute to environmental burden reduction. This paper describes the concept of evaluating the environmental burden reduction of ICT solutions and the method for certifying them as environmentally conscious solutions.

2. Environmental contribution aspects and aims of ICT solutions

ICT solutions help improve the efficiency (in terms of cost and speed) in all fields of business, including electronic conferencing over the Internet, factory operation and logistics, digitization of various content (music, video images, and documents), and warehouse and office management. These improvements in business efficiency can be regarded as improvements in environmental contribution effects or improvements in the efficiency of the use of fuel, energy, resources, and space in relation to the transportation of people and goods and the consumption of materials (**Figure 2**).

In other words, although the introduction of ICT products and solutions in an enterprise increases energy consumption due to the installation of equipment, the environmental contribution effects of an ICT system can not only compensate for this increase but also make the overall operation of an enterprise much more eco-friendly.

In addition to their original environmental contribution effects, environmentally conscious solutions are also intended to help customers and society contribute to the environment.

3. Scope of environmental burden evaluation

Environmental burden evaluation is applied to all ICT solutions that are handled by the Solution Business Support Group other than independent ICT solutions. To evaluate the environmental aspect of an ICT solution, its environment burden is analyzed quantitatively. This analysis is generally done for a solution's entire life cycle (from development to disposal); however, with the new method, only a solution's environmental burden in the installation and operation process is analyzed to make it clear that the environmental contribution effect depends on

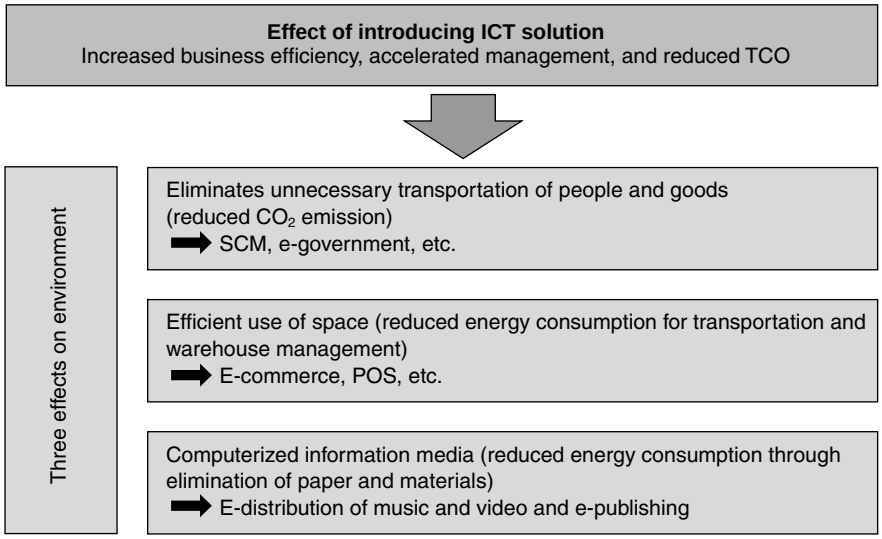


Figure 2
Environment-serving effects of an ICT solution.

the activities of individual employees.

4. Concept of quantitative evaluation of ICT solutions

Fujitsu Laboratories Ltd. has developed an environmental burden assessment method to evaluate in detail the environmental burden of each ICT solution objectively and quantitatively at its installation.[1),2)] This method enables us to digitize and measure the environmental burden factors of a process before and after an ICT solution is introduced, analyze the degree of reduction in the process's environmental burden, and evaluate the environmental contribution effect of the solution (**Figure 3**).

In general, introducing an ICT solution brings both a negative effect — an increase in the use of energy by ICT equipment and networks — and a positive effect — a decrease in the consumption of materials, human transportation, and the use of space. Several case studies have shown that the positive effect of introducing an ICT solution always surpasses the negative effect and that introducing ICT helps reduce the environmental burden.

5. Procedure and standard for certifying environmentally conscious solutions

The Solution Business Support Group established the environmental contribution solution certification system in June 2004 to certify the ICT solutions that meet the specified standard for environmental improvement. The solutions certified by this system so far have already been offered to customers.

One of the criteria for certifying an ICT solution is that it must reduce carbon-dioxide emission by 15% or more. This criterion was set so that certified solutions would exceed Japan's estimated target reduction of 14% (reported in fiscal 2003), which was increased from the 6% target assigned to Japan by the Kyoto Protocol.

The procedure for certification as an environmental contribution solution is as follows:

1) Evaluation

Step 1: The ICT solution is evaluated according to the common certification standard (**Table 1**). If the solution conforms to the standard, the procedure moves to Evaluation Step 2.

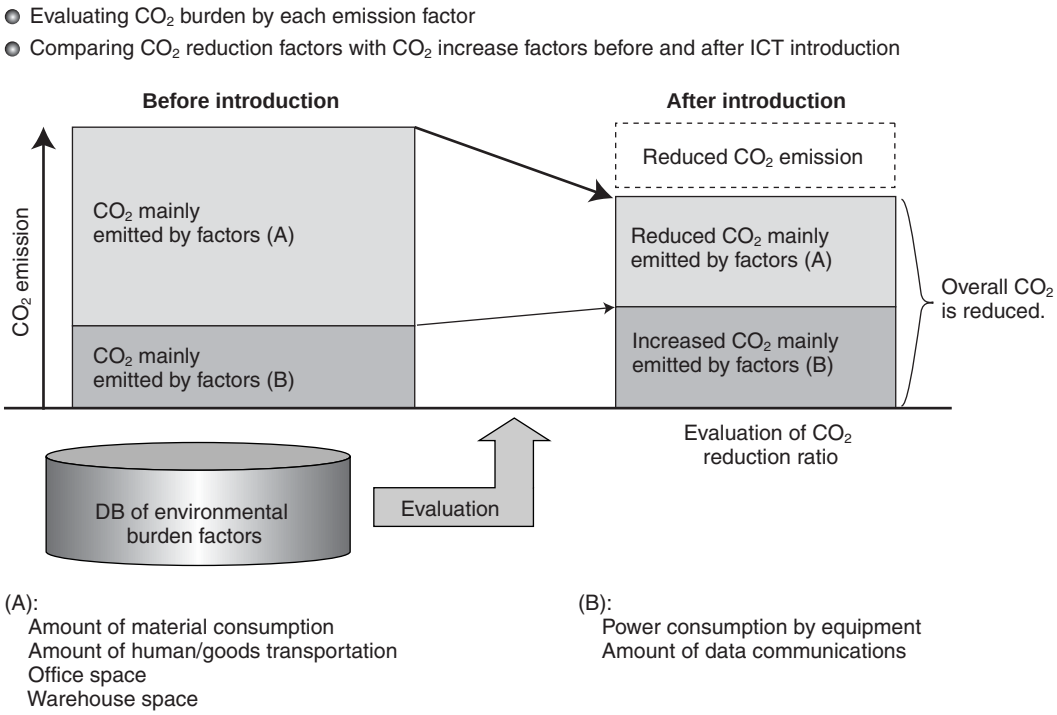


Figure 3
Evaluating the environmental burden of an ICT solution.

Table 1
Common standards for evaluating environment-serving solutions.

No.	Item	Effect	* Grade (example)
1	Printing	Print preview function is available, and paper can be reduced.	1
2		Print page counter function is available, and reduction of paper can be evaluated.	1
3		Memo function is available, and paper can be reduced.	1
4	Equipment used	Green Products are incorporated, and environmental burden can be reduced.	1
5	Downloading	Download function is available; and mail, media, and transportation can be reduced.	1
6	E-mail	E-mail function can be used; and mail, media, paper, and transportation can be reduced.	1
7	Web compatibility	Display function using the Web is available; and mail, paper, and transportation can be reduced.	1
8		Q & A reception function using the Web is available; and mail, paper, and transportation can be reduced.	1
9		Order reception function using the Web is available; and mail, paper, and transportation can be reduced.	0
10	EDI transaction	Payment function using Electronic Data Interchange (EDI) is available; and mail, paper, and transportation can be reduced.	0
11	Noise	Noise emissions are reduced.	0
12	Waste water	If water is discharged, water pollution can be prevented using a provided measure.	0

* Grade points: –1 (solution has no beneficial effect), 0 (irrelevant), and +1 (solution has a beneficial effect).
Solution is judged acceptable if no item is evaluated as –1.

Step 2: The environmental contribution effects are measured and evaluated before and after the ICT solution is introduced by using the environmental burden assessment method. If the evaluation result indicates that the solution reduces carbon-dioxide emission by 15% or more, the solution becomes a candidate environmental contribution solution and the procedure moves to Evaluation Step 3.

Step 3: The solution is evaluated by three divisions (Fujitsu Laboratories, Environmental Division, and Solution Business Support Group) for final judgment. If judged acceptable, it is certified as an environmental contribution solution.

2) Certificate issuance and use

The solution is issued a certificate, use of the Environmental Emblem mark is permitted for the solution, and the mark can be added to the solution's name in catalogs to attract customers.

One example of an ICT solution is e-learning. This is a new education system that was evolved using information technology from conventional forms of education such as collective and correspondence education. It solved the problems of collective education such as restrictions on time and place and the problems of correspondence education such as difficulties in understanding the students' situations and delivery of materials through the use of Web-based training.

E-learning supports various types of education formats ranging from the live-broadcasting type to streaming and on-demand types, is free from the restrictions of time and place, and uses Web texts. E-learning greatly reduces the need for human transportation, which is the biggest environmental burden of collective education; in fact, the environmental burden of e-learning is only 10% or less that of collective education. (An evaluation of the effects of introducing a distance-education system is shown in **Figure 4**.)

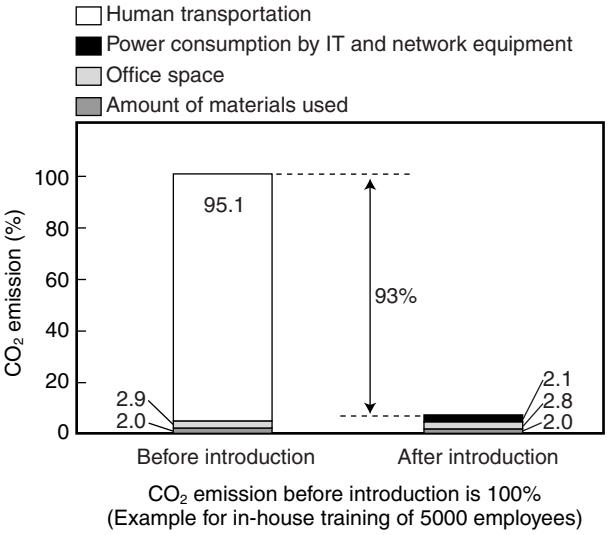


Figure 4
Evaluation of e-learning's effects on CO_2 emission.

6. Future issues

The environmental burden assessment method used for the certification system measures and evaluates only the environmental burden before and after the introduction of an ICT solution at the customer's site. Therefore, in the future, we need to study the following:

1) How to extend the evaluation method to the system integration (SI) proposals we make to customers
2) How to include the environmental burden of the development and disposal processes in the method

We intend to promote environmental contribution activities to all domains of Fujitsu's Solution Business Support Group.

References

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2) T. Hashitani et al.: Method for Approving ICT Solutions as Environmentally Conscious. *FUJITSU Sci. Tech. J.*, **41**, 2, p.153-159 (2005).

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