

Fujitsu Group's Activities for Global and Domestic Product Recycling

● Takashi Kudou ● Makoto Ichimura

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In line with the domestic environmental movement aimed at zero emissions and the recycling of waste products, in December 1998 Fujitsu became the first company in the industry to establish a recycling system in Japan (known as the Fujitsu Recycling System). This was a scheme whereby the Fujitsu Group collects waste products from industrial users for disposal and recycling. We began recycling operations by setting up Fujitsu recycling centers operated by Fujitsu's affiliated or partner companies in five bases nationwide, with Fujitsu Logistics Ltd. (as it was known at that time) in charge of customer relations. We now offer a recycling service as a certified, wide-area waste disposal agent under the Waste Disposal and Public Cleansing Law, and have established a scheme to collect waste products from both industrial and individual users. Moreover, in 2002 we launched recycling schemes overseas, and have implemented recycling services through seven bases in the five countries of the US, Canada, Australia, the Philippines, and Singapore until December 2007.

1. Introduction

In 1991, the "Law for the Promotion of Utilization of Recycled Resources" for promoting recycling was established. A series of illegal disposal issues had attracted public attention between 1993 and 1998, and the disposal of waste was controlled by the "Waste Disposal and Public Cleansing Law" (**Figure 1**). Because of economic activities based on mass consumption and mass disposal, the lack of final waste disposal sites has become a serious problem in conjunction with the increased concern about the global depletion of various natural resources. Aware of the importance of having a recycling-based society where environmental conservation is compatible with economic growth, the government established "The Basic Law for Establishing the Recycling-Based Society" in 2000. This law stipulates the obligation for business operators to make efforts to construct a recycling-based society at every phase of their business operations. Further, the

"Basic Plan for Establishing the Recycling-Based Society", which stipulates policies to be implemented based on The Basic Law for Establishing the Recycling-Based Society, was formulated in 2003. Since the enforcement of The Basic Law for Establishing the Recycling-Based Society, a series of recycling laws have been enforced, including the Law for Recycling of Specified Kinds of Home Appliances. Also in 2000, with the purpose of expanding the scope of approaches from 1R (Recycle) to 3Rs (Reduce, Reuse, Recycle), significant modifications were made to the previous "Law for the Promotion of Utilization of Recycled Resources" to formulate the "Law for the Promotion of Effective Utilization of Resources (Modified Recycling Law)". Before the government became fully committed to this law, a zero-emission movement had been widely introduced among manufacturing operators between 1999 and 2002. In this movement, such operators were discouraged from selecting the reclamation disposal of industrial waste as

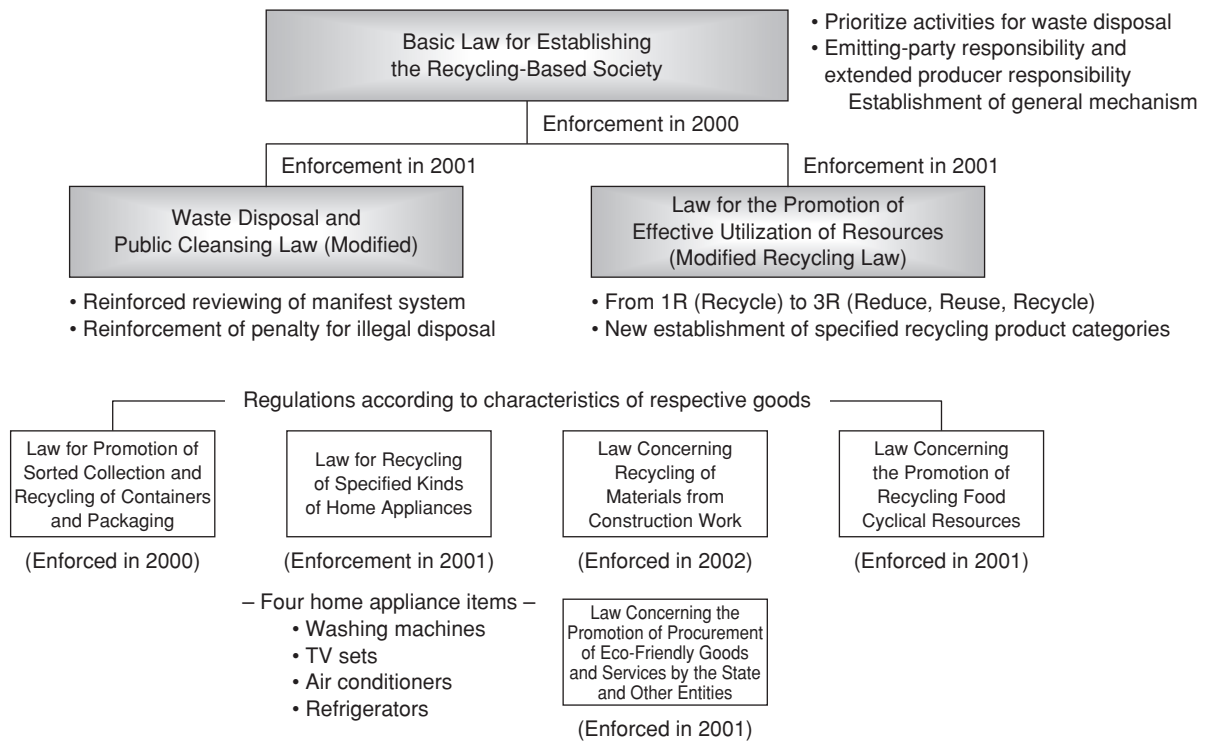


Figure 1
Environmental laws and regulations in Japan.

the final disposal method. To promote recycling, computers were specified as a specified recycling product in the Law for the Promotion of Effective Utilization of Resources (Modified Recycling Law). This specification was enforced in April 2001 for corporate PCs and in October 2003 for consumer PCs (Figure 2). In Europe, the WEEE Directive^{note)} came into force and obligated sales companies to collect their used products.

2. Fujitsu's approach to recycling of resources

In line with the domestic environmental movement aimed at zero emissions and the recycling of waste products, in December 1998 Fujitsu became the first company in the industry to es-

note) Abbreviation of Waste Electrical and Electronic Equipment. It is an EU directive concerning the waste of electrical and electronic equipment that mandates manufacturers to collect and recycle any such equipment that they sold.

- PC (specified recycling product): Field newly established
 - Scope:

a) Desktop PCs	b) Notebook PCs
c) CRT displays	d) LC displays
 - Collection method: Establishment of voluntary collection system by manufacturers
 ⇒ Operation based on recycling schemes for general consumers and industrial users respectively
 - Recycling status: Announced actual collected amount (weight and number of unit collected ÷ reuse rate) is published every year combining those items collected from general consumers and from industrial users
 Targeted reuse rate stipulated by ordinance No. 1 of METI and MOE in March 2001
 ⇒ a) 50% b) 20% c) 55% d) 55%
 - Application:

PCs for industrial users	⇒ Enforced in April 2001
PCs for general customers	⇒ Enforced in October 2003
- METI: Ministry of Economy, Trade and Industry
 MOE: Ministry of the Environment

Figure 2
Law for the Promotion of Effective Utilization of Resources (Modified Recycling Law).

establish a Recycling System in Japan (known as the Fujitsu recycling system). This is a scheme whereby the Fujitsu Group collects waste products from industrial users for disposal and re-

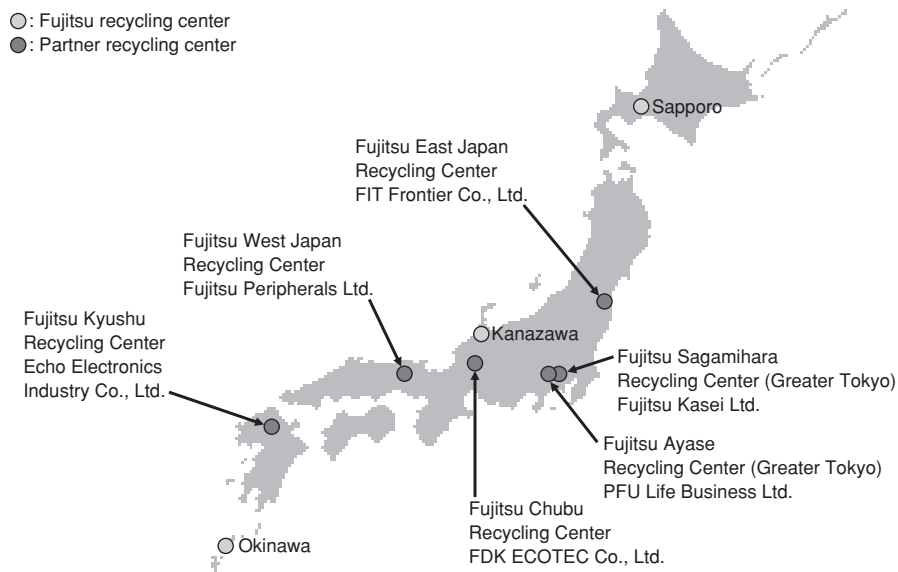


Figure 3
Fujitsu Recycling Centers for industrial users.

cycling. We began recycling operations by setting up Fujitsu Recycling Centers operated by Fujitsu's affiliated or partner companies in five bases nationwide, with Fujitsu Logistics Ltd. (as it was known at that time) in charge of customer relations. Details of Fujitsu's recycling centers are shown below.

1) Expansion of Fujitsu Recycle System (FRS)

While FRS was operated based on five sites initially, the network was expanded to cover six sites as indicated in **Figure 3** (East Japan Recycling Center, Sagami-hara Recycling Center [Greater Tokyo], Ayase Recycling Center [Greater Tokyo], Chubu Recycling Center, West Japan Recycling Center, and Kyushu Recycling Center) in addition to three new recycling centers (Sapporo, Kanazawa, and Okinawa), operated by partners, to enhance the convenience for users.

2) Collection scheme for customers

As a collection scheme of waste products for customers, there is a recycling scheme for general consumers and a recycling scheme for industrial users. Having been approved for a license as a certified wide-area waste disposal agent by the Ministry of the Environment under the "wide-

area waste recycling certification system", Fujitsu has established a collection and recycling scheme. Within the framework of this wide-area certification system, there is a service for recycling IT products for industrial users, and a service for recycling PCs for general consumers. The mechanism of these services is described later.

3) Characteristics of Fujitsu Recycling Center

To prevent any risk of damage to the users and to ensure safe and reliable disposal, Fujitsu is carrying out the following activities:

- Treatment based on a unified treatment standard (disassembling standard). A disassembling standard is stipulated for each type of IT equipment. This standard specifies the method of deleting user information as well as removal or destruction of memory media such as hard disk drives (HDDs). It also includes a provision for the destruction of specific functions of equipment. The same disassembling standard for disassembling treatment is used in all Fujitsu recycling centers.
- Prevention of user information leakage (deletion of user information including user

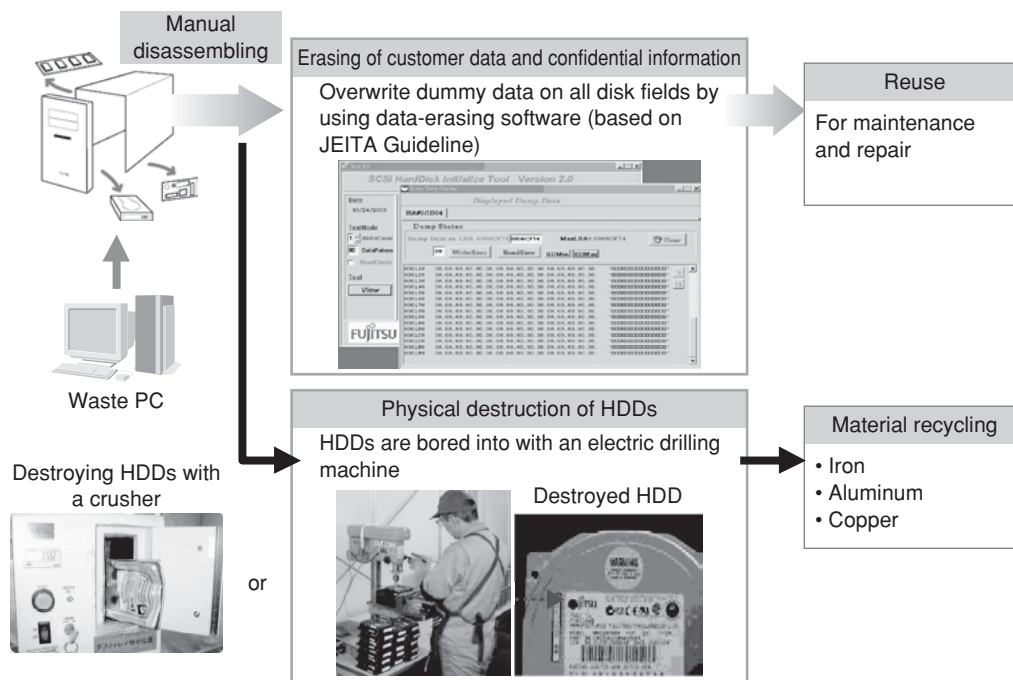


Figure 4
Data erasing and physical destruction of HDDs.

names, HDD data deletion and HDD destruction; see **Figure 4**). This involves the deletion of user information by removing equipment control number labels that include user information and that are attached to IT equipment. Further, HDDs are destroyed by boring into them with a drilling machine or crushing them with a crusher.

- Assurance of traceability from acceptance to final disposal (to support traceability, we have introduced a unified information control system for recycling). Based on the unified information control system for recycling, information of the accepted waste products is registered for each user or for each manifest from the terminal unit arranged at each process line in the recycling center. In this way, it is possible to identify where the waste product is in the treatment process of the recycling center, and to keep a record of it up to the screening recycling stage.
- Thorough security control. We are maintaining visual records by setting up cameras

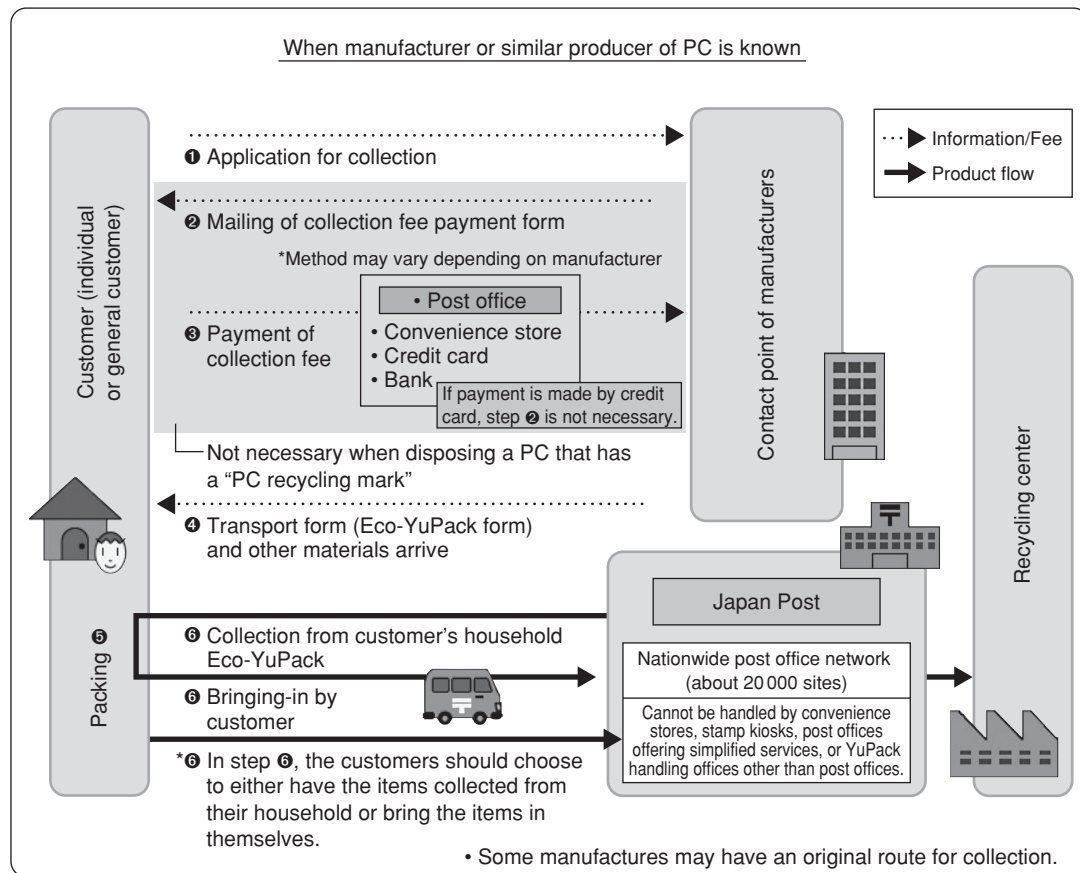
in each recycling center. Deletion and destruction of data on HDDs are carried out in a special room, the access to which is controlled with ID cards.

- Disassembling and screening are conducted fully by manual operations. Material is converted into modes convenient for reuse by crushing waste plastic and palletizing or reducing the volume of foam material. The reuse rate [(amount of recycled parts + recycled resources) ÷ amount of waste IT products treated] by Fujitsu exceeds 90 percent.

3. PC recycling service for general consumers

This service is based on the common collection route supported by Japan Post Co., Ltd. in the industry. If an individual consumer wants to dispose of four kinds or parts of a PC (desktop PC, notebook PC, CRT display and LC display), the consumer needs to file a disposal application with the contact point of the manufacturer who sold that PC to the consumer. A mail registra-

<Mechanism>



Source: PC 3R Promotion Center¹⁾

Figure 5
Collection and recycling of PCs for general consumers.

tion sheet for the Eco-YuPack service is sent to the consumer, and then the Japan Post collecting staff directly visit the customer's household to collect the PC-related items. Alternately, the customer can bring those items to any post office. The collected PCs are gathered in a depot via the Japan Post distribution sites. The PCs are sent to the relevant recycling site of each manufacturer (Fujitsu has three recycling center sites) for recycling (Figure 5). Any PCs that were sold to individual consumers after October 2003 are collected and recycled free of charge by each manufacturer, based on the Law for the Promotion of Effective Utilities of Resources and the modified ordinance (announced in April 2003). The consumer needs

to pay a charge to have any PCs that were sold before October 2003 collected and recycled.

4. IT product recycling service for industrial users

The IT product recycling service for industrial users refers to the service for industrial users provided by Fujitsu as a manufacturer, based on the wide-area waste recycling certification system of the Ministry of Environment. In this framework, manufacturers are consigned to dispose of waste IT equipment collected from domestic industrial users including government agencies, local authorities, companies and hospitals (Figure 6).

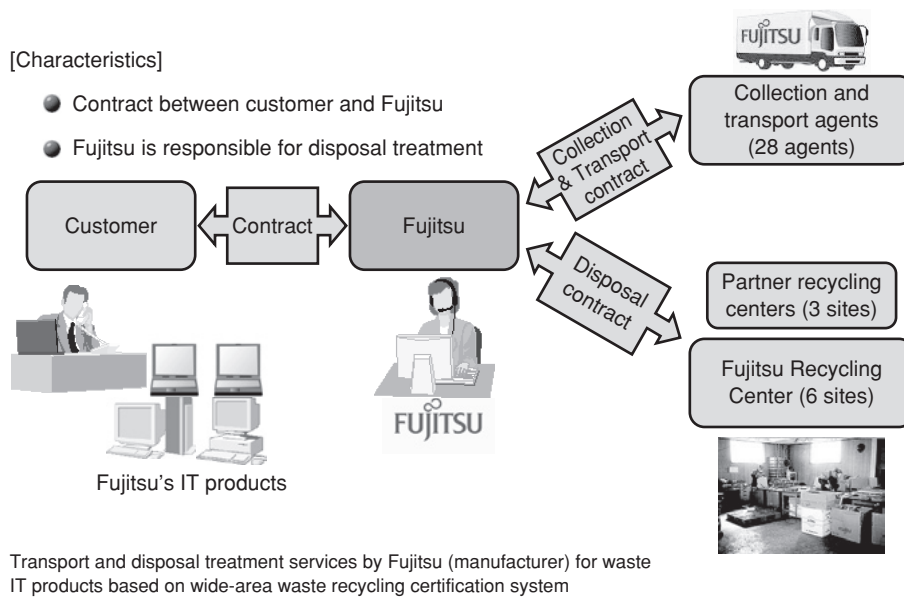


Figure 6
Recycling services of IT products for industrial users.

When industrial users dispose of their IT products, they usually need to contract with a transport agent and a disposal agent respectively in each prefecture (cities designated by government ordinance) who are certified under the Waste Disposal and Public Cleansing Law. However, when they use this service, the only contract they need to enter is a contract with Fujitsu. Besides, this system offers convenience to users who have sites all over the country, because they can consign this service based on a single contract instead of having to find a certified transport agent and a disposal agent in each district and entering into multiple contracts.

Also, when disposing of industrial waste, users normally need to issue and manage a format called a “manifest”. However, if they use the IT product recycling service for industrial users, they do not need to follow the procedures related to the manifest if they have a written contract and a disposal completion report, because that evidence is used in place of the manifest based on the wide-area waste recycling certification system.

In the actual waste transport and waste disposal services, only certified, wide-area waste dis-

posal agents are used to provide safe and reliable services on a continuous basis. Transport service providers are the partners of Fujitsu who have sufficient capabilities to transport IT equipment, and all the disposal procedures are performed in Fujitsu’s recycling centers.

Fujitsu proposes a series of services from the introduction to the operation and disposal of IT equipment as LCM (Life Cycle Management) services to its customers. By providing an appropriate service for treating industrial waste when IT equipment has come to the end of its life cycle, the company is committed to contributing to the formation of a recycling-based society and helping conserve the global environment.

5. Establishment of a global recycling system

The increase of waste IT products and information security poses a serious concern in the global arena. Giving consideration to this situation, some countries including Japan and those in the EU have established laws and regulations that stipulate that manufacturers should assume responsibility to appropriately treat waste elec-



Figure 7
Global status of product recycling services.

tric and electronic devices of specific types, based on the concept of extended producer responsibility. In August 2005, the WEEE Directive was enforced and the collection of waste electric and electronic equipment has become mandatory. To address this directive, Fujitsu started establishing a recycling system for waste IT equipment in European markets in 2004, ahead of its competitors. In recent years, the trend of obligating manufacturers to collect their waste electric and electronic equipment has been accelerating. Also in North American and Asian markets, this trend of mandatory collection is becoming more prominent.

In this section, Fujitsu's advanced activities for collecting waste IT equipment in the North American and Asian markets are briefly described. We believe the movement for mandatory recycling of waste electric and electronic equipment will progress in the near future in these areas (mandatory recycling has been already enforced in some states and countries; see **Figure 7**).

As a target of the Fujitsu Group's Environmental Protection Program (Stage IV), Fujitsu has been committed to establishing a recycling system for waste IT equipment in North American and Asian countries. As a result, by December 2007 we were offering recycling services in seven bases in five countries, namely the US, Canada, Australia, the Philippines, and Singapore.

In establishing the recycling system for waste IT equipment, Fujitsu formulated a unified screening standard for selecting recycling agents based on the domestic experiences and the guidelines set by overseas governments. Based on this standard, we selected recycling partners and entered into contracts with them. Through this system, the Fujitsu Group is able to offer to its customers the services to collect waste IT equipment and to appropriately treat the collected IT equipment at the recycling partners' sites.

The following is the details of our activities in this field.

Fujitsu Transaction Solutions Inc. (USA) started a recycling service in 2002. The company collects waste POS systems and other items from customers, modifies those systems at the company's shop and offers them to customers for reuse. This service has been used by about 40 percent of its customers.

Fujitsu Australia Ltd. (Australia) started a recycling service for IT products from April 2006. As of February 2007, the company has recycled approximately 250 tons of waste POS systems collected from the leading retailing companies in Australia.

Fujitsu Philippines, Inc. (FPI) Group (Philippines) introduced a pilot project for recycling waste electronic products from June 2006. By February 2007, it had collected 27 tons of waste products collected from the FPI Group and its customers and had recycled them. It started full-scale deployment of an IT product recycling service from May 2007 and has been disposing of the waste IT products in an environmentally friendly manner.

In Hong Kong, the Fujitsu Group has been positively involved in a computer recycling program since its launch in January 2008, in cooperation with other electric and electronic companies and retailers. Also in Thailand, we plan to start offering a service for recycling waste IT equipment within FY2008. Through these activities, the deployment of a collection system for waste

electronic equipment within the European, Asian, North American and Oceanian markets has been almost completed.

Fujitsu is determined to continue pursuing its social responsibility as a manufacturer to prevent the destruction of the environment through the illegal disposal of waste IT equipment. Further, by actively using the global system (information network) and establishing a highly efficient collection scheme for waste IT equipment, Fujitsu will offer a reliable recycling service to its customers and promote the reuse of disposed resources, as well as the research and development of environmentally friendly products that can be produced using fewer resources.



Takashi Kudou
Fujitsu Ltd.

Mr. Kudou received the B.E. degree in Mechanical Engineering from Tsuruoka National College of Technology. He joined Fujitsu Ltd., in 1974, where he worked on manufacturing technology for semiconductors, especially in the photo, etching, and ion-implantation processes at the Electronics Device Department. After being promoted,

he worked on handling and remedying failures in the pre-treatment, diffusion and CVD processes. In 2001, he moved to the Corporate Environmental Affairs Unit and promoted the reduction of environmental burdens related to factories. He had been planning and promoting green process activities which integrated reductions of cost and of environmental burdens by improving processes. He is currently involved in product recycling.

6. Conclusion

Fujitsu considers that an important element of product recycling is the assurance of appropriate treatment to secure safety and reliability for the customers.

With the growth of overseas recycling activities, Fujitsu will make continuous efforts to review the mechanism for securing appropriate treatment to be compliant with the related regulations.

Reference

- 1) PC3R Promotion Center: PC Recycling Manual (as of March 2005).



Makoto Ichimura
Fujitsu Ltd.

Mr. Ichimura graduated from the Department of Economics, School of Political Science and Economics, Meiji University in 1989 with a bachelor's degree in Economics. He joined Fujitsu Ltd., in 1989. He engaged in planning the marketing systems in the Marketing Planning Division. He was in charge of supporting the service business and

partners in the Infrastructure Service Division after the Marketing Division. At present, he is in charge of planning the LCM (life cycle management) service and recycling service for businesses.