

# Chapter One

## Life-Enhancing “Environmental Techniques”

### <Summary of Chapter One>

Today, a wide range of ideas and activities aimed at protecting the environment is being undertaken at all levels of society. For example, environment-friendly products and environmentally conscious business operations have been made possible by technological development. These kinds of environmental conservation technologies and environmentally conscious methods and systems are called “environmental techniques” in this Annual Report. This chapter introduces various environmental techniques in the following three areas: residence and workplace, leisure, and manufacturing. While examining the effects of these techniques, the chapter will also introduce environmentally conscious management methods and corporate structures.

## Section 1: Environmental Century Made Possible by Techniques

### 1. Examples of “Environmental Techniques” in Residence and Workplace

Japanese architecture has traditionally been designed with emphasis on good ventilation. Except in cold areas such as Hokkaido, insulation of buildings has not made much progress. For example, the installation of double-glazed glass windows is much less common in Japan compared to European countries.

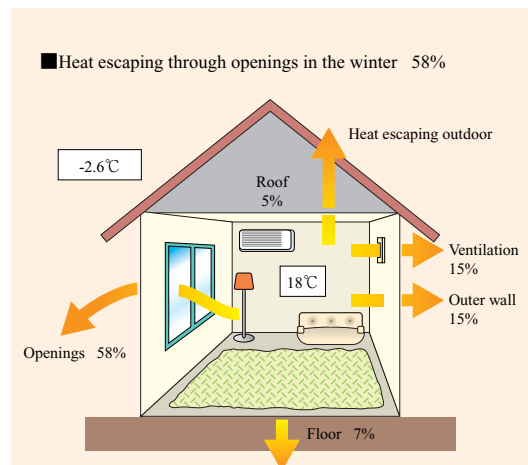
It is said that 58% of the heating in a room during winter escapes and 73% of heat in an air conditioned room during summer enters through windows and door openings. Therefore, the use of double-glazed glass or window sashes with good insulation at the openings is effective in cutting down energy use for heating and air conditioning. Using better insulating materials for the walls can also improve the insulation of buildings. Installing window awnings or eaves, planting trees in the yard, utilizing blinds or curtains can also help create a cool and comfortable living space under the strong

Coefficient of Heat Transmission by Glass Type

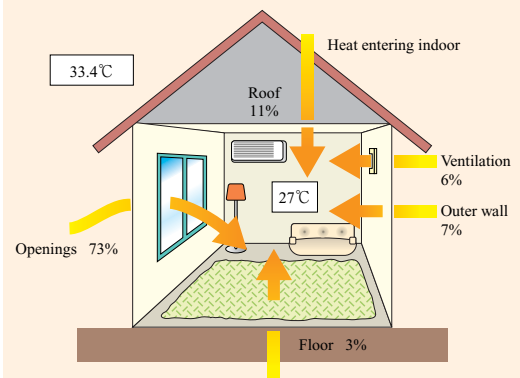
Type of glass	Coefficient of heat transmission [W/(m <sup>2</sup> · K)]
Float glass plate 3 mm	6.0
Double-glazed glass (air space 6 mm)	3.4
Double-glazed glass (air space 12 mm)	2.9
Heat shield double-glazed glass (air space 6 mm)	2.5
High performance heat shield double-glazed glass (air space 12 mm)	1.7~1.9

Notes:  
 1. All glass used for double-glazed glass is 3 mm thick.  
 2. “Coefficient of heat transmission” refers to the easiness of heat transmitted from indoor to outdoor through walls, etc.  
 Windows and walls with good insulation have smaller coefficients.  
 Source: Center for the Dissemination and Promotion of Energy Efficient Construction Materials under the Federation of Construction Materials Industries, Japan.

Heat Flowing In and Out of Openings (%)



■ Heat entering through openings in the summer 73%



Note: House model built based on the 1992 construction standard  
 Sources: Liaison Council for the Dissemination and Promotion of Insulation under the Institute for Building Environment and Energy Conservation; and the Center for the Dissemination and Promotion of Energy Efficient Construction Materials under the Federation of Construction Materials Industries, Japan, *Quick Guide to Energy Saving Standards for Residential Buildings*.

summer sun.

Due to market penetration, the price of photovoltaic power generation system for households is going down. In addition, 2005 is expected to see the market launch of fuel cells for household use. The use of energy-saving navigator or home energy management systems (HEMS) is also said to be effective in rationalizing energy use at home.

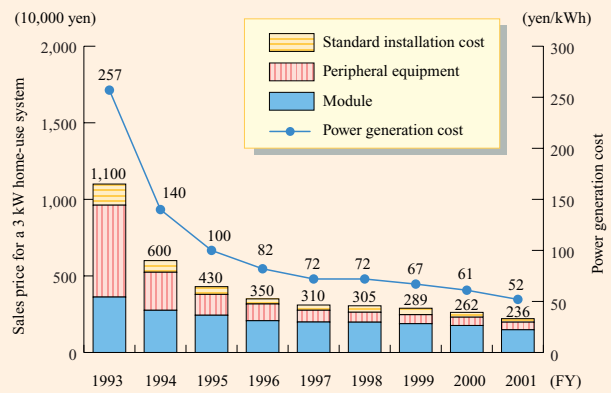
In the workplace as well, photovoltaic power generation equipment and cogeneration equipment are being installed. Energy service companies (ESCO), which provide comprehensive energy-saving services including necessary technologies, equipment, human resources, and capital for buildings and factories, have attracted attention.

Based on the Law concerning the Rational Use of Energy, the Top Runner method was adopted for home electrical appliances. It sets the standards for home electrical appliances, taking into account the functions of currently available products that are the most energy efficient and evaluating the prospect of further technological development. Adoption of the method has helped advance the development of energy-saving technologies. For instance, effort is made to lower electricity consumption not only during use but also when the television is in standby mode. Liquid crystal televisions, which consume less electricity than televisions using cathode-ray tubes, are rapidly gaining in popularity.

Electricity consumption for lighting accounts for about 16% of the electricity consumed in a household. Compared to incandescent lamps of the same brightness, electric bulb-type fluorescent lamps use only one-third of the electricity and their useful life is six times longer.

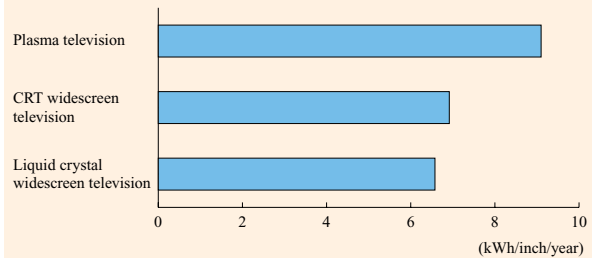
The energy used for air conditioning and heating accounts for about 25% of electricity used in a household. This appliance consumes the most energy. With advances in technology such as inverter control, energy conservation is making progress. Compared to five years ago, an air conditioner/heater with the same energy output uses 20% less electricity today.

### Changes in the Price of Photovoltaic Power Generation System



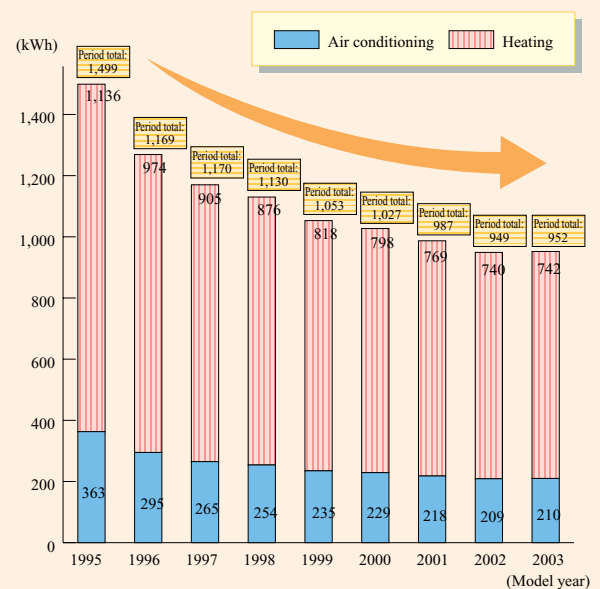
Source: New Energy and Industrial Technology Development Organization

### Comparison of Power Consumption per Inch of CRT Widescreen Television, Liquid Crystal Television, and Plasma Television



Notes:  
 1. "CRT widescreen television" includes "widescreen television" and "high-definition television" in the GPN database.  
 2. To compare with CRT widescreen television, the sizes of liquid crystal television and plasma television are increased by 10% to compensate the difference in screen size (e.g. 17 inch liquid crystal TV → 18.7 inch liquid crystal TV).  
 Source: Compiled by the Ministry of the Environment based on the Green Purchasing Network, GPN Database.

### Changes in the Annual Power Consumption of Air Conditioners/Heaters



Notes:  
 1. The power consumption of each period is calculated based on the JRA4046 standard (standard for calculating room air conditioner/heater's power consumption) set by the Japan Refrigeration and Air Conditioning Industry Association.  
 2. The above values are for an air conditioner/heater with air-conditioning capacity of 2.8 kW.  
 Source: Energy Conservation Center, Japan.

## 2. Examples of “Environmental Techniques” in Leisure

“Environmental Techniques” are useful not only in daily life but also in leisure activities.

Different individuals may have different interpretations of ecotourism. The Ministry of the Environment defines “ecotourism” as tourism having the following three elements and aiming at integration and continuous pursuit of these elements: (i) tourism that enhances understanding of the natural and cultural resources unique to the area and that contains educational and descriptive elements to facilitate enjoyment of their appeals; (ii) tourism that implements protection and conservation measures and that gives consideration for environmental load reduction to enable the sustainable use of resources; and (iii) tourism that contributes to revitalization of the local community and its economy. It is hoped that ecotourism will enable local residents to gain a new understanding of the natural and cultural values of their community and give vitality to their regions through exchanges with ecotour participants.

Hotels and Japanese inns are also taking environmentally conscious measures. For example, a Japanese inn in Toba City, Mie Prefecture, uses a facility inside the inn to reprocess the large amount of left over oil from cooking *tempura* into bio diesel fuel (BDF) and uses it for the bus that transports guests. Raw garbage is made into compost. Waste heat from private power generation is used to heat water for the inn. During the off-season months, the pool is used to collect rainwater for watering plants and washing cars.

The load put on the environment differs substantially depending on the means of transportation selected for traveling. For example, the use of railroads will emit only about 8% of carbon dioxide emitted from motor vehicle use.

## 3. Examples of “Environmental Techniques” in Manufacturing

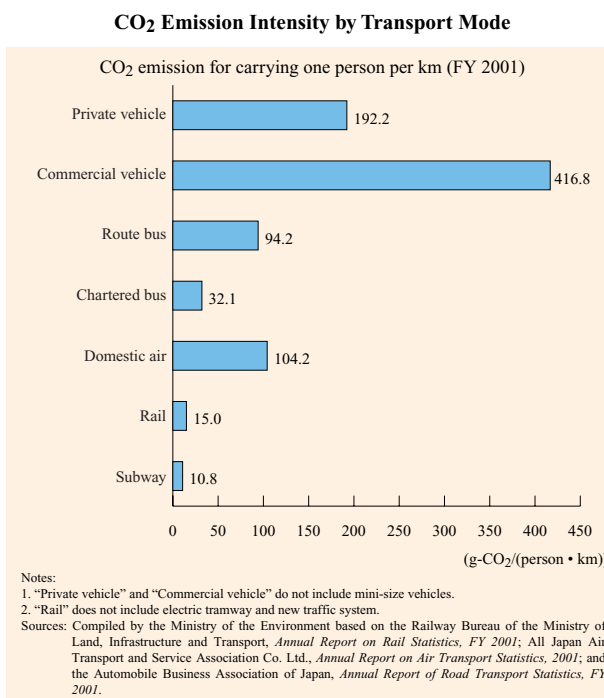
In the products that we use everyday, there are those that are designed not only to lower environmental load during use but also incorporate environmental considerations throughout the product lifecycle, from its production to disposal.

Measures are being taken to minimize waste at the time when a product is to be disposed of and to make recycling of the product easier. For example, to make scrapping easier, a computer manufacturer has reduced the number of screws used to one-tenth of that used ten years ago. It is said that the time consumed in scrapping is now shorter and the cost of parts is lower.

An iron and steel company has succeeded in cutting down the use of coking coal by replacing some of the coking coal needed in the process of reducing iron ore to pig iron by blowing waste plastics into the blast furnace. Used plastics can be utilized effectively as resources. They can be recycled as raw materials, and waste plastics can be collected and used eventually as blast furnace feed.



Ecotour in Karuizawa  
(Courtesy of Japan Travel Bureau Foundation)



## Section 2: Progress in Environmentally Conscious Business Activities

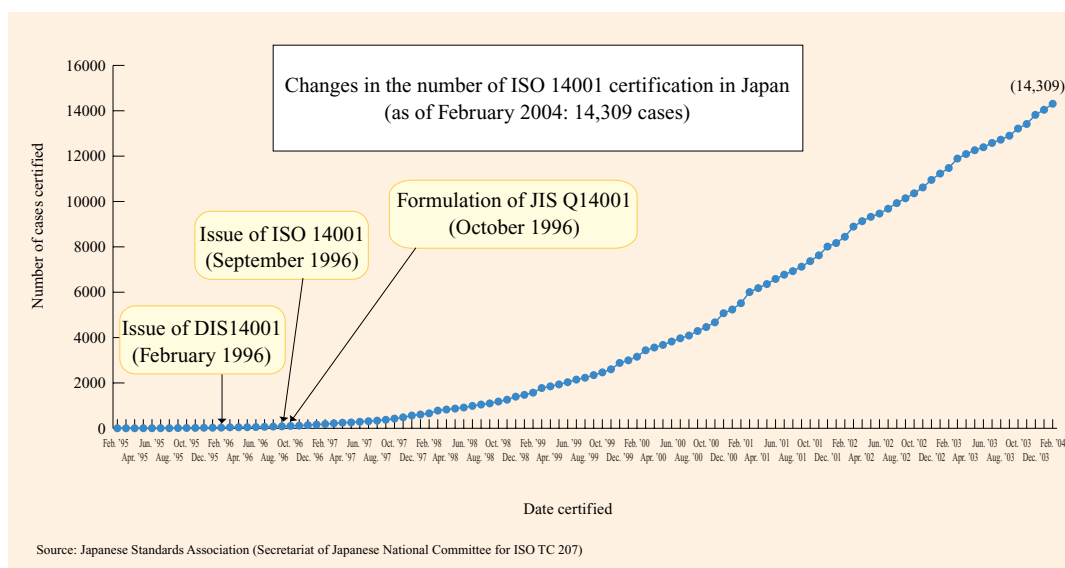
“Environmental Techniques” are also found in management methods and business structures. Many big corporations have adopted environmental management systems and environmental reports. The financial sector has also launched environmentally conscious initiatives.

### 1. Environmental Management System

“Environmental management system” is a means that enables a company to undertake environmental conservation measures on a voluntary basis. The company sets up its own environmental principles and goals, and establishes systems and procedures for its factories and business sites to implement measures for achieving the goals.

The ISO 14001 established by the International Organization for Standardization (hereinafter referred to as “ISO”) is a representative international standard for environmental management systems. The ISO 14001 aims at improving environmentally conscious efforts through the continuous implementation of PDCA (Plan, Do, Check, and Act).

Changes in the Number of ISO 14001 Certification in Japan



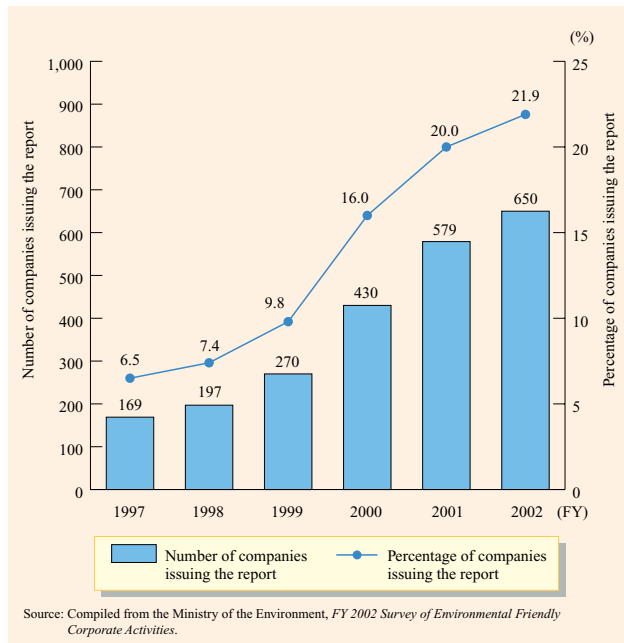
Because the acquisition of ISO 14001 certification imposes great strain on small and mid-sized companies, the Ministry of the Environment formulated the Eco Action 21 program in 1996 aimed at encouraging all businesses, including small and mid-sized companies, to undertake voluntary environmental measures. In FY 2003, the number of registered businesses exceeded one thousand. The Eco Action 21 program was revised in FY 2004 to introduce a certification/registration system that enables external assessment. It is hoped that this revision can further encourage small and mid-sized companies to take environmentally conscious measures.

### 2. Environmental Report

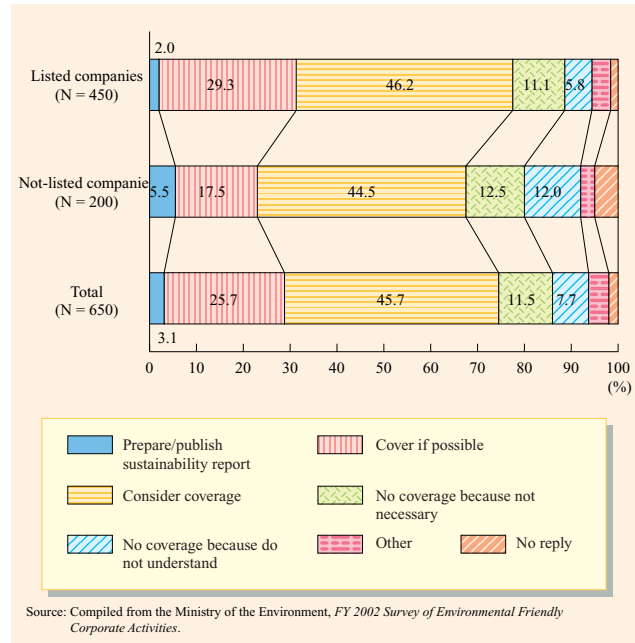
Businesses use environmental reports to give the public an overview of environmental information, which include their principles for environmental conservation, goals, plans, status of environmental management, and progress in measures to lower environmental load.

First of all, it serves as an important means of environmental communication that links businesses and society. If the consumers, business partners, and investors use the information provided in the environmental reports as a basis for selecting businesses, products, or services, then proactive measures with environmental consideration will become highly regarded by the society and the market. This will further enhance the environmental awareness of the society as a whole. Secondly, the preparation and publication of the environmental report provides the opportunity for a business to

### Changes in the Number of Companies Issuing Environmental Report



### Coverage of Social and Economic Aspects in the Report



formulate or review its own principles, goals, and action plans for environmental initiatives. Environmental reports are also useful as a means to familiarize employees with the contents of the company’s environmental initiatives and to enhance their environmental awareness.

The number of companies compiling and publishing environmental reports is increasing steadily. 21.9% of the businesses answered that they issued environmental reports. In FY 2002, 34% of the companies listed in the stock market and 12.2% of the companies not listed issued environmental reports.

Against the backdrop of intensive scrutiny on a company’s social responsibility in recent years, an increasing number of companies began issuing “sustainability reports” or “corporate social responsibility (CSR) reports” in order to add a social aspect to the conventional environmental aspect. These companies account for one-fourth of the companies that already compile and issue environmental reports.

### 3. Environmental Considerations by the Financial Sector

In recent years, financial institutions have shown increasing interest in the environment. In the background lies the possibility that environmental problems may affect the operations of financial institutions. (For example, a company being financed may present the risk (credit risk) of defaulting on payments when its cash flow is strained by unexpected expenditures incurred due to remedial measures for problems such as soil contamination or groundwater contamination.) At the same time, environmental problems also present new business opportunities for financial institutions.

Through the redistribution of capital to businesses, financial institutions indirectly exert great influence on the environment. They can appeal to businesses applying for funds to integrate the concern for environmental problems into their business operations.

Another example is that some banks offer low-interest financing for the purchase of low-emission vehicles. Some insurance companies offer lower insurance rates known as “Eco-car Discounts.”