Chapter One

Actions Taken by Individuals towards the Building of a Sustainable Society

<Summary of Chapter One>

Given that many of today's environmental problems originate from daily life and ordinary business activities, individual measures aimed at tackling these problems must carefully be made to cover all aspects of our daily lives and activities. This chapter draws attention to the daily activities of individuals. While showing the specific environmental loads arising from our daily activities, it points out that if the individual actions in daily life were to evolve into a larger movement, other actors could be influenced and become instrumental in the transition to a sustainable society.

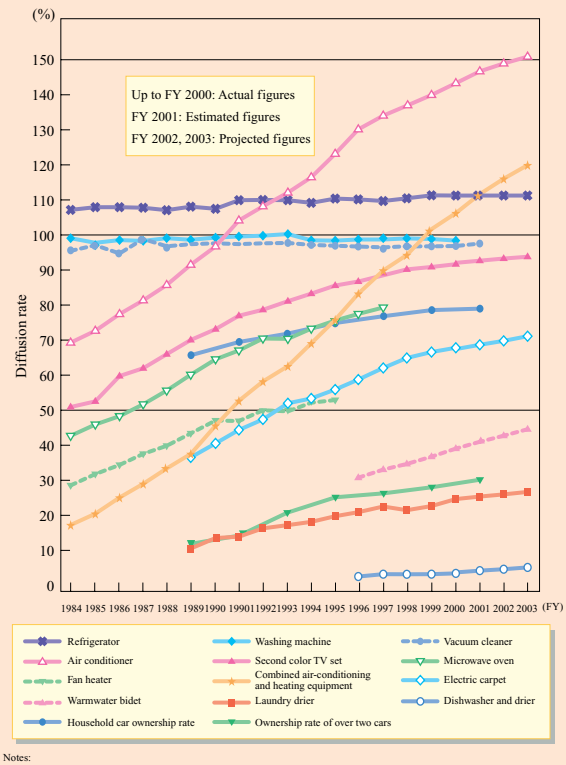
Section 1: Changes in the Socio-economy that Affect the Actions of Individuals

1. Post-war Changes in Japan's Socio-economy and Environmental Problems

In the post-war years between the mid-1950s and mid-1960s, priority was placed on restoration of the economy. With the expansion of productive activities and the rise in incomes, various products, such as the so-called "three sacred treasures" consisting of the electric washing machine, the electric refrigerator, and the black-and-white television, became a part of daily life. Along with these changes, areas in Japan that suffered from pollution also increased nationwide, and the destruction of nature proceeded on a national scale, destruction that included the loss of nature in communities and reclamation of tidelands and shallows.

In the mid-1970s, with the economy shifting towards steady growth, the number of single-person households increased, more women entered the workforce, dining-out and use of processed food such as pouch-packed food increased, and new services such as door-to-door delivery were started. Due to the two oil crises that took place around this time, certain progress was made in energy conservation. However, the environmental load that accompanied ordinary business activities and daily life increased, and urban and domestic pollutions became evident.

Diffusion Rate of Durable Consumer Goods in Households



Notes:
1: For home electric appliances, figures shown here are actual figures up to FY 2000, estimated figures for FY 2001, and projected figures for FY 2002 and 2003.
2: For color TVs, figures are the diffusion rate of owning two or more sets.
3: Car ownership rate represents ownership per household.
Sources: Compiled by the Ministry of the Environment based on *Overview of the Demand and Supply of Electricity* edited by the Electricity and Gas Industry Department, Agency for Natural Resources and Energy; and *Market Trend Survey: Passenger Vehicles*, Japan Automobile Manufacturers Association, Inc.

Since the "bubble economy" in the mid-1980s, expenses for durable consumer goods, such as the purchase of more than two televisions or vehicles per household, and spending for the service industry, such as for leisure and recreation, showed remarkable growth. With the globalization of economic activities, the socio-economic system of mass production, mass consumption and mass disposal expanded worldwide and tangible signs of global environmental problems became evident.

2. Relationship between Socio-economy, Daily Life and the Environment in Recent Years

Changes of the socio-economy in recent years impacted the environment in various ways, in both positive and negative manner.

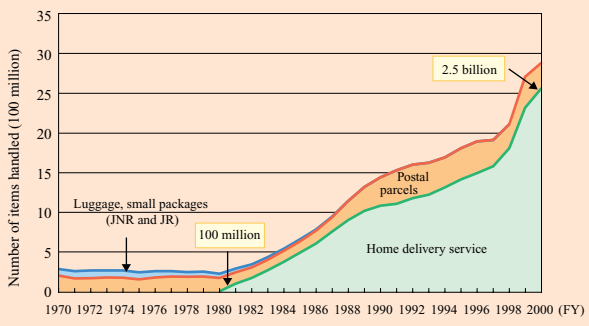
The trends of families with fewer children and an aging population have led to an increase in the number of house-

Chronology of Socio-economic Events of Japan

	National and international events		Events related to everyday life in Japan
Rapid economic growth; In search of material wealth	● Period of rapid economic growth (1955) Outbreak of Itai-itai disease (Jintsugawa River basin) (1956) Economic Survey of Japan, *No Longer in Postwar Era*, published. (1956) Outbreak of Minamata disease (1960) Plan to double national income launched ● Period that raised the issue of pollution (1960) Pollution at Yokkaichi worsened (asthma, etc.) (1962) Smog continued for one week (Tokyo) (1962) *Silent Spring* by Rachel Carson published (1962) National Comprehensive Development Plan (1964) Tokyo Olympics held (1965) Outbreak of second Minamata disease, Niigata Minamata disease (Aganogawa River basin) (1967) Basic Law for Environmental Pollution Control enacted (1967) Niigata Minamata disease lawsuit, Yokkaichi pollution lawsuit (1969) Mankind's first landing on the moon (1970) Osaka Expo held (1970) Frequent occurrence of photochemical smog in Tokyo; Air pollution from soot and dust and from SOx (1970) 14 pollution-related laws passed at the 64th Diet (so-called Pollution Diet) (1971) Environment Agency founded (1972) *Limits to Growth* by Club of Rome published (1972) Declaration on the Human Environment issued by the United Nations Conference on the Human Environment; United Nations Environment Programme established (1972) Plan for a drastic modernization of national infrastructure (Japanese Archipelago Remodeling Plan) announced	Jinmu economic boom 1954–1957 Iwato economic boom 1958–1961 Olympics economic boom 1962–1964 Izanagi economic boom 1966–1970 National remodeling economic boom 1971–1973	(1953) TV broadcast started (1953) Emergence of instant foods **[Three sacred treasures]** **B&W TV, electric washing machine, and electric refrigerator** (1962) Metropolitan Expressway opened; Private car ownership began to increase (1962) Agricultural population fell to less than 30% of total labor force (1964) Tissue paper appeared on the market (1964) Overseas travel deregulated (1964) Operations of Tokaido Shinkansen Line began (1965) Entire route of Meishin Expressway opened (1966) Japan's population exceeded 100 million (1967) The phrase "nuclear family" became popular (1969) Emergence of freezer/refrigerator (two doors) (1969) Entire route of Tomei Expressway opened (1970) Number of vending machines exceeded one million
Steady growth period; From the pursuit of material wealth to convenience	● Period when people became aware of energy issues and environmental problems in urban areas (1973) Fourth Middle East War and the First Oil Crisis (1974) Possibility of CFCs depleting the ozone layer pointed out. (1978) "Urban-type combined pollution" lawsuit in Nishiyodogawa City (1979) Second Oil Crisis; Energy-saving Law enacted (1980) Japan's automobile production became No. 1 in the world (1980) First US Space Shuttle launched		(1974) First convenience store opened (1975) Operation of Sanyo Shinkansen Line (Okayama–Hakata) started (1979) "Energy-saving suits" attracted attention (1982) Emergence of PET bottle (1982) Operation of Tohoku and Joetsu Shinkansen Lines started (1983) The phrase "One-room mansion (apartment)" became popular (1984) Longevity of both Japanese males and females became No. 1 in the world
Period of globalization; Emergence of global environmental problems	(1985) Law for Equal Employment Opportunity of Men and Women enacted (1985) Tsukuba Expo held ● Period that heightened awareness of global environmental problems (1985) Vienna Convention for the Protection of the Ozone Layer adopted (1986) Nuclear accident occurred at Chernobyl (1987) Montreal Protocol adopted (1988) Intergovernmental Panel on Climate Change (IPCC) established (1989) Oil spill accident of *Valdez* (1990) Remaining capacity of final disposal sites: Volume equivalent to 7.6 years (industrial) and 1.7 years (general) of disposal ● Period that implemented policies for sustainable development (1992) Earth Summit held (1992) Basel Convention took effect (1992) Convention on Biological Diversity adopted (1993) Basic Environment Law enacted (1994) WTO established (1996) ISO 14001 formulated and issued (1997) Kyoto Protocol adopted at COP3 (1997) Oil spill accident of *Nakhodka* (1998) Law concerning the Promotion of Measures to Cope with Global Warming enacted (1998) Japan's GNP became No. 2 in the world (2000) Basic Law for Establishing the Recycling-based Society enacted; Second Basic Environment Plan approved by the Cabinet; World population exceeded six billion (2002) Kyoto Protocol ratified	Bubble Economy 1986–1991	(1986) Emergence of films-with-lens camera (1987) Mobile phone services started (1987) The phrase "DINKS" became popular (1988) Seikan Tunnel opened; Seto-ohashi Bridge completed (1989) Consumption tax (3%) introduced (1989) Operation of Internet started (1989) Eco Mark introduced (1990) Number of Japanese traveling overseas per year exceeded 10 million (1991) Beef and orange imports deregulated (1992) Two-day weekend system took root; 5-day school week started (1993) Bad harvest of farm produce due to cold summer (1993) Number of convenience stores exceeded 40,000 (1994) Water shortage due to severe summer heat (1994) Program subsidizing home-use solar power generation system started (1995) Single-person households accounted for 25% of total households (1997) Consumption tax raised to 5% (2000) Households using personal computers exceeded 50% (2001) Households using Internet exceeded 50% (2002) Mobile phone users exceeded 50% of Japan's total population

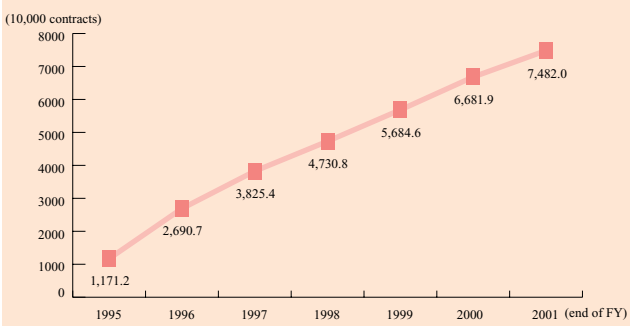
Source: Ministry of the Environment

Changes in the Transportation of Products in Small Quantity



Source: *Domestic Transportation Statistics Handbook*, Ministry of Land, Infrastructure and Transport

Changes in the Number of Mobile Communications Service Contracts



Note: The number of contracts is the total of contracts for mobile phones and PHS.

Source: Compiled by the Ministry of the Environment based on *WHITE PAPER 2002–Information and Communications in Japan*, Ministry of Public Management, Home Affairs, Posts and Telecommunications

holds. It became necessary for a household, as the smallest unit of daily life, to have its own housing facilities, such as kitchen and bathroom, and durable consumer goods, such as washing machines, refrigerators, etc. The increase in these facilities also resulted in an increase in the consumption of energy and water.

While innovations in information and telecommunications technologies have raised expectation in the reduction of environmental load through work practices known as telework and SOHO and through the timely provision of appropriate environmental information, the increase in information and telecommunications equipment and excessive information exchanges are causing an increase in energy consumption.

While it is feared that individual ownership of equipment and the active 24-hour lifestyle may increase the environmental load caused by daily life, people's desire to spend more time in nature and participate in volunteer activities can be seen as a promising trend that may lead to higher awareness about environmental conservation efforts.

In this way, socio-economic changes often exert positive or negative impact on the environment through daily life. Therefore, it is necessary to fully understand and tackle today's environmental problems as a sequence of problems closely related to changes in our socio-economy and to the way we lead our daily lives.

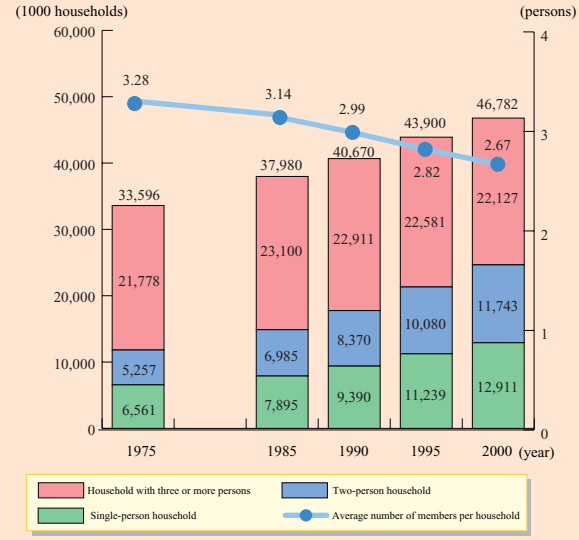
3. Increase in Environmental Load Resulting from Daily Life

Environmental load resulting from daily life increases due to changes in the socio-economy.

Carbon dioxide, a major contributor to global warming, is emitted from all aspects of our production and consumption activities. In Japan, emissions from the residential sector in FY 2000 increased 20.4% from FY 1990 levels and increased 4.1% from the previous fiscal year.

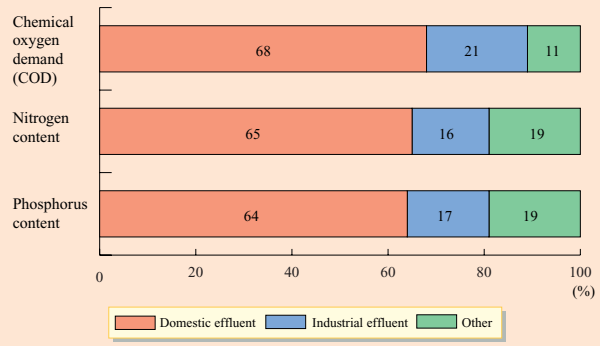
In terms of Japan's material balance in FY 2000, among the 2.13 billion tons of resources used, about 50% were consumed and disposed of. Only about 10% of the materials were recycled as resources. In terms

Changes in the Numbers of Households and Household Members (General Households)



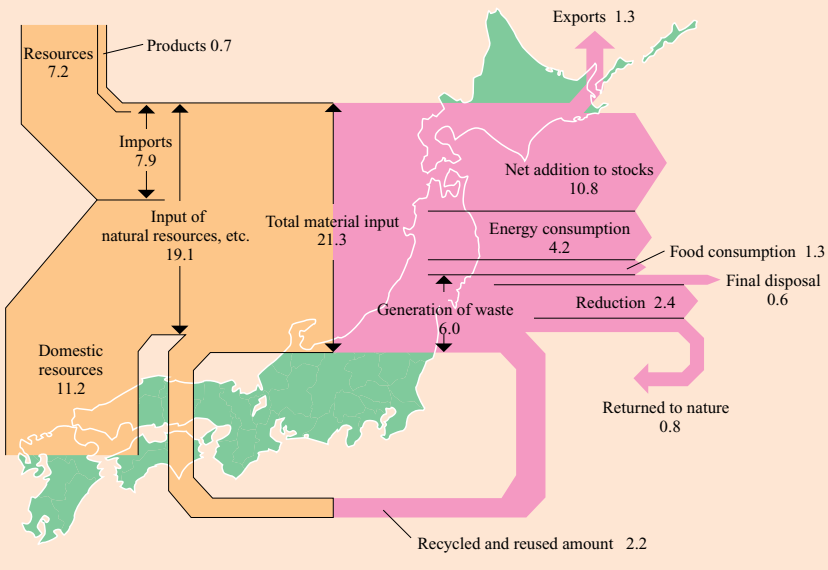
Sources: Compiled by the Ministry of the Environment based on the *Population Statistics Data Book (2000)*, National Institute of Population and Social Security Research; and *2000 National Population Census*, the Ministry of Public Management, Home Affairs, Posts and Telecommunications.

Percentage of Pollution Load by Source in Tokyo Bay (FY 1999)



Source: Compiled from the *Basic Policy of Total Reduction of Chemical Oxygen Demand, Nitrogen and Phosphorus* (December 2001), the Ministry of the Environment

Japan's Material Balance (FY 2000) (Unit: 100 million tons)



Note: The total output is greater than the total input due to water intake, etc.
Source: Compiled by the Ministry of the Environment based on various statistics

of general waste, including "household waste" produced by our daily life, the generation of waste per capita per day has remained at high levels in recent years.

Domestic effluent is the major cause of water pollution in enclosed water areas. In terms of COD, domestic effluent accounts for 70% of the pollutant load, especially in Tokyo Bay.

Section 2: Environmental Load from the Daily Life of Every Individual and Effects of Various Efforts

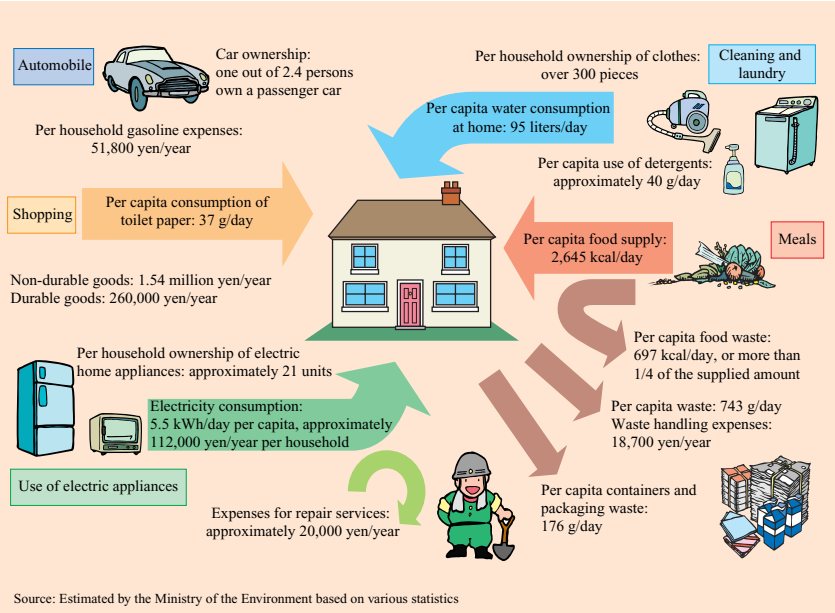
1. Environmental Load from Daily Life

It is important to have an overall view of the load our daily activities exert on the environment. The environment is burdened not only in visible forms, such as the consumption of energy and resources through the use of electric home appliances, supply of water, and purchase of disposable goods, but also from the use to the disposal of products and services, which include the processing of materials and distribution of products.

Let us focus attention on product lifecycle energy (amount of energy used by a product throughout its lifecycle). In terms of environmental load, a large percentage of energy consumption in a year resulted from the use of products used in daily life, such as air conditioners and heaters, lighting and vehicles. A product may consume a large amount of energy in its manufacturing process, but its energy consumption per year may be smaller. On the other hand, the energy consumption of electricity or detergent may be small per day but may be substantial when calculated for an entire year.

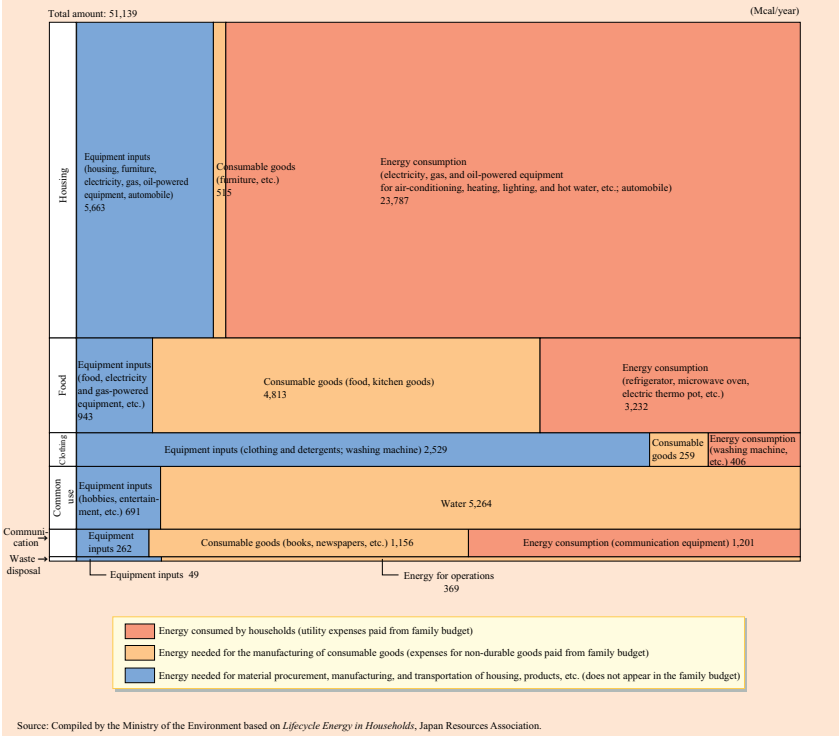
Comparing the product lifecycle energy used in 1979 and 1994, energy consumption during production decreased 24%, thanks to energy conservation efforts in plants and other facilities; however, overall energy consumption increased 5.5% due to substantial increases in the use of electricity, gas and oil at homes.

Environmental Load from Daily Life



Source: Estimated by the Ministry of the Environment based on various statistics

Breakdown of Lifecycle Energy Used in Households



Source: Compiled by the Ministry of the Environment based on *Lifecycle Energy in Households*, Japan Resources Association.

Food mileage (unit: ton-km) is an index that shows the distance between the place where the food is produced and where it is consumed—a yardstick to measure environmental load caused by transportation. With a low food self-sufficiency rate, Japan is experiencing an increase in environmental load from food imports.

In view of the fact that environmental loads from our daily lives, including those resulting from activities not taking place within our living areas, are the cause of global environmental problems, we must make conscious efforts to consider the environment in our daily activities.

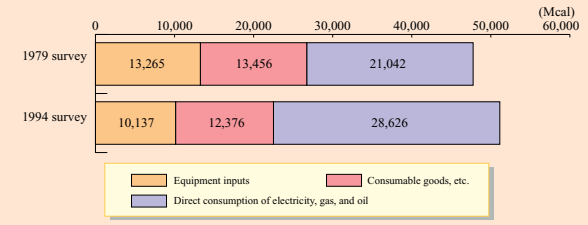
2. Reduction of Environmental Load in Daily Life and Concrete Effects

We can take various environmental-conscious actions in our daily lives.

The following are some examples of such actions: energy saving by adjusting the temperature of air conditioners and heaters to an appropriate level and making conscious efforts to save electricity; saving resources by reducing waste and recycling; and using environment-friendly products and services. For our leisure activities, we can participate in the activities to conserve and create a rich environment such as ecotourism and environmental volunteer activities.

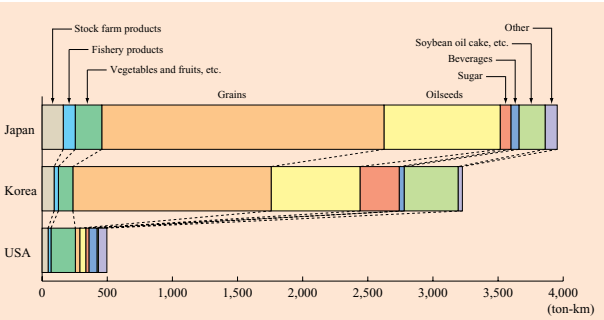
The results of these measures are diverse. For example, even if the effect of each measure is small, if all households in Japan attempt ten actions, about 34.7 million tons of carbon dioxide can be reduced. This is equivalent to 2.8% of the amount of emissions of the base year as provided in the Kyoto Protocol. An accumulation of casual actions in daily life can have great significance. However, in view of the fact that carbon dioxide emissions from the residential sector is in the increase, we cannot say that our actions in our daily lives are achieving satisfactory results, making it even more important to start with activities in our everyday lives.

Changes in Lifecycle Energy by Category



Sources: Compiled by the Ministry of the Environment based on *Studies on Lifecycle Energy* (1979), Resources Research Institute of the Science and Technology Agency; and *Lifecycle Energy in Households* (1994), Japan Resources Association

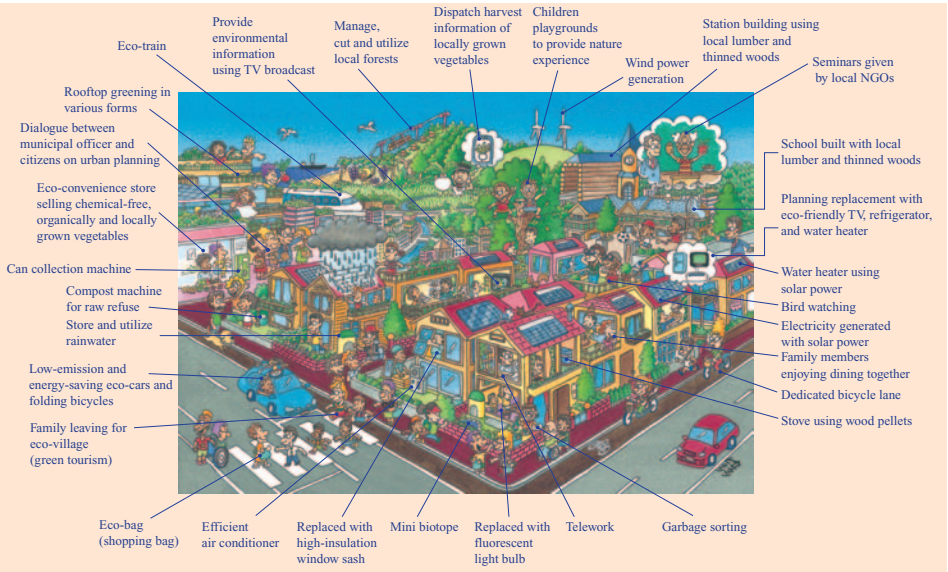
Food Mileage of Imported Food Products (Per capita estimate)



Notes:
1. Calculated by multiplying the amount of food imports from each of the exporting countries (top 15 countries) by the transport distance between the exporting country and the importing country.
2. Food products are those in the category of Nos. 2 to 4, 7 to 12 and 15 to 24 of the Commodity Classification Codes (HS Code) used in the *Trade Statistic*, Ministry of Finance.
3. Transport distance is substituted by the slant distance between the exporting country or region and the capital of the importing country.

Source: Estimated by the Policy Research Institute of the Ministry of Agriculture, Forestry and Fisheries (PRIMAFF) based on various trade materials

Wa-no-Kurashi—Lifestyle Emphasizing Simplicity, Quality and Sustainability



Source: *My Wa-no-Kurashi Handbook* (August 2002), Ministry of the Environment

Global Warming Measures by Individuals

If each family implemented the following activities, a 2.8% reduction in greenhouse gas emissions in Japan would be realized (compared to the 1990 level).

(CO_2 equivalent)

	Measures	Annual CO_2 reduction per household	Emission reduction to the total emission per household per year (%)	Annual savings per household	Remarks
1	Raise air conditioner settings by 1℃ and lower heater settings by 1℃	Approx. 31 kg/year	0.5%	Approx. 2,000 yen/year	Use curtains to control the amount of sunlight; adjust the amount of clothing worn; do not depend on the air conditioner and heater; and put off using the air conditioner and heater as long as possible.
2	Reduce driving distances 8 km twice a week	Approx. 185 kg/year	3.1%	Approx. 8,000 yen/year	When commuting or going shopping, use bus, rail, or bicycle. Walking and riding a bicycle are also good for health.
3	Stop the engine during idling for 5 minutes a day	Approx. 39 kg/year	0.7%	Approx. 2,000 yen/year	When parking or stopped for an extended time, turn off the engine. It also contributes to reducing the emission of air pollutants.
4	Reduce standby electricity consumption by 90%	Approx. 87 kg/year	1.5%	Approx. 6,000 yen/year	Turn off main power. When not using for a long period, unplug the electric cord. When buying new products, select one with lower standby power consumption.
5	All family members reduce shower time 1 minute per day	Approx. 65 kg/year	1.1%	Approx. 4,000 yen/year	Turn off shower when washing.
6	Use leftover bath water for the laundry	Approx. 17 kg/year	0.3%	Approx. 5,000 yen/year	Some use the leftover bath water to water the garden or in the toilet in addition for laundry. Commercially available pumps make it easy to use the bath water.
7	Don't use warming feature of electric rice cookers/warmers and electric pots	Approx. 31 kg/year	0.5%	Approx. 2,000 yen/year	The warming feature of electric rice cookers and electric pots is used over long periods of time and consumes a lot of electricity. Warming the rice in the microwave will reduce electricity use.
8	Reduce heating and lighting by 20% by having the entire family in one room	Approx. 240 kg/year	4.1%	Approx. 11,000 yen/year	When family members are in different rooms, excessive lighting and heating are necessary.
9	Carry a shopping bag; choose minimally packaged vegetables	Approx. 58 kg/year	1.0%		When trays and wrapping are carried home, they are soon thrown away. Reduce receiving plastic grocery bags at the register by carrying a shopping bag.
10	Select TV programs and reduce TV viewing 1 hour per day	Approx. 13 kg/year	0.2%	Approx. 1,000 yen/year	Watch only the selected TV programs.
	Total	Approx. 766 kg/year	13.0%	Approx. 41,000 yen/year	
	Total effect in Japan	Approx. 34.7 million tons/year	2.8% reduction of greenhouse gas emissions in Japan (compared to the 1990 level)		

Notes:
1. Annual per household CO_2 emissions: approx 5,900 kg; Number of households in Japan: 47.42 million (1999); Number of passenger cars in Japan: 40 million
2. Method of calculating the total effects in Japan: emissions reduction from automobiles (2 and 3 of the above measures) x 40 million (cars) + all other emissions reduction measures x 47.42 million (households) = 34.7 million tons

Source: *Personal Measures against Global Warming: 10 Things a Family Can Do*, Ministry of the Environment

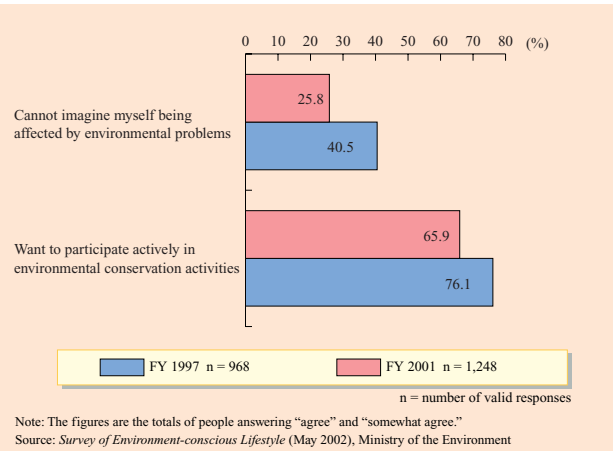
Section 3: Great Possibility Arising from Individual Efforts

1. Gap between the Awareness on Environmental Problems and Concrete Actions

More and more people are seeing environmental problems as their own concerns and are saying that "citizens" are the important actors in environmental conservation efforts. This shows that people's awareness on environmental problems has heightened.

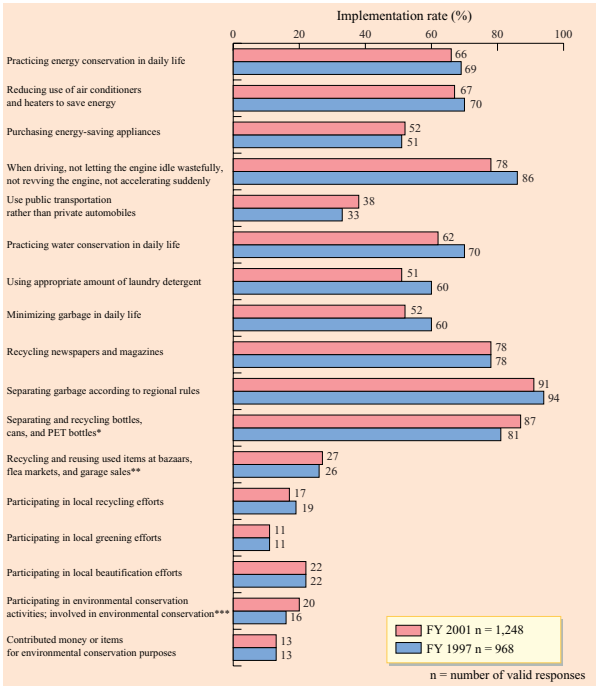
In terms of concrete actions, while environmental conservation activities being done as a rule (sorting waste, recycling of newspapers and magazines, etc.) and those that have direct economic benefits (conserving electricity and saving energy when using air conditioner and heater, etc.) are carried out, participation in activities in which the results are not directly observable—such as donations to

Opinions on Environmental Problems



Note: The figures are the totals of people answering "agree" and "somewhat agree."
Source: *Survey of Environment-conscious Lifestyle* (May 2002), Ministry of the Environment

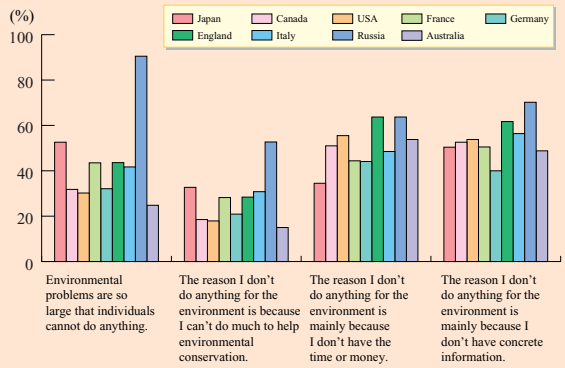
Implementation Status of Environmental Conservation Activity



Notes: The values represent the percentage of respondents who answered "Always" or "Almost always."
*: In FY 1997 survey, the item was "Separating and recycling cans and bottles."
**: In the FY 1997 survey, the item was "Recycling used items at bazaars, flea markets, and garage sales."
***: The value for FY 2001 represents the percentage of respondents who replied "At least once," the value for FY 1997 represents the percentage of respondents who replied "Always," "Almost always," and "Sometimes."

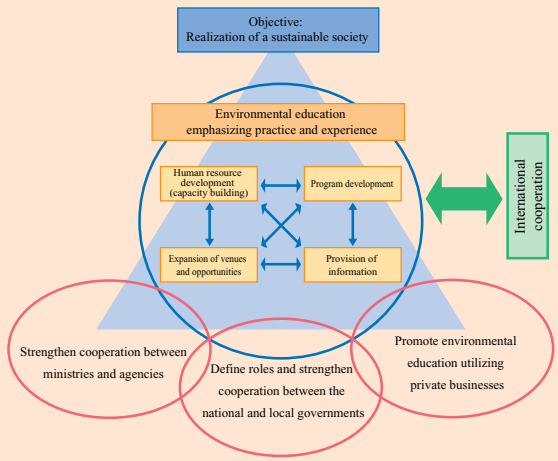
Source: *Survey of Environment-conscious Lifestyle* (May 2002), Ministry of the Environment

International Comparison of Environmental Awareness



Source: Compiled by the Ministry of the Environment based on *The Fifth International Environmental Monitor (30 countries)*, Environics International

Measures for the Promotion of Environmental Education and Learning



Source: Ministry of the Environment

environmental conservation organizations and participation in local greening activities, local beautification activities and the activities of environmental conservation organizations—is still comparatively low. This shows that the heightened awareness of environmental problems does not lead to actual environmental conservation activities.

According to the result of an international joint survey on environmental problems, the fact that the heightening of awareness does not lead to active participation in environmental conservation activities is mainly due to the perception that individual actions cannot contribute much to the solution of environmental problems.

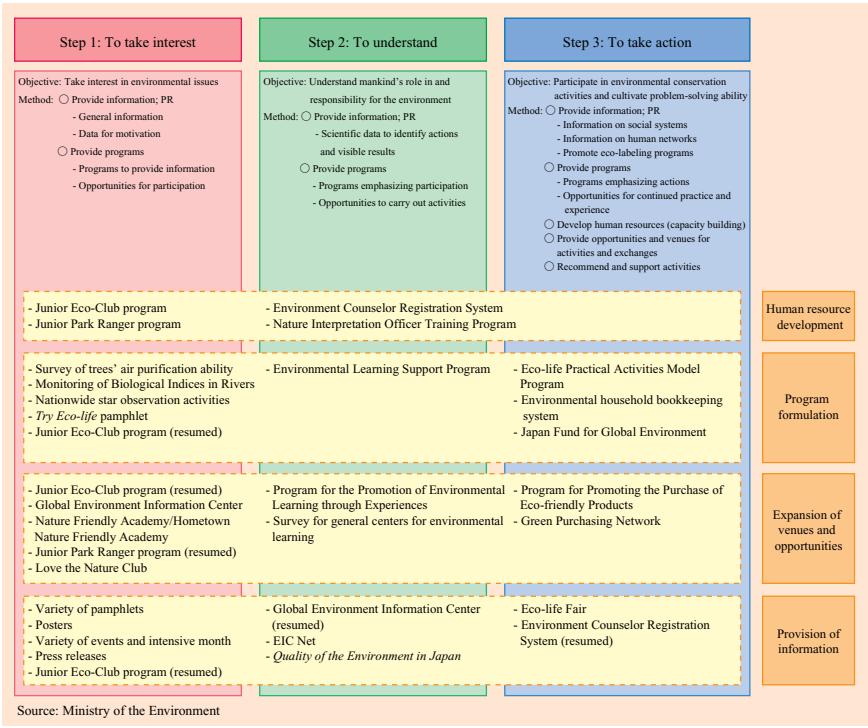
2. Changes in Individuals that Prompt Actions

An individual goes through several steps before taking concrete actions to protect the environment. The first step is to become aware of environmental problems and to become interested. The next step is to understand the close cause-and-effect relationship between the environmental problems and our daily activities. The final step is the realization that one's actions can provide various solutions and the taking of initiative to build capacity for solving the problem. Environmental education and learning and environmental information play an important role in facilitating the advancement in these steps.

A report from the Central Environment Council presented eight approaches for promoting environmental education and learning policies. The report points out that implementation of the following four of the eight approaches can facilitate the promotion of environmental education and learning with emphasis on actual practices and experiences: (1) capacity building—establishing a human resource development system to cultivate diverse human resources with knowledge and techniques to gain the impetus for progress, (2) program development—creating venue-specific and topic-specific programs so that they lead to actual actions, (3) information provision—gathering information to create a database for environmental education and to systematically accumulate information of various actors, and (4) expansion of opportunities and venues—creating opportunities and venues where people can actually experience environmental conservation activities. Because environmental education and learning are important means for promoting actions for the realization of a sustainable society, it becomes increasingly important to ensure the effectiveness of environmental education and learning.

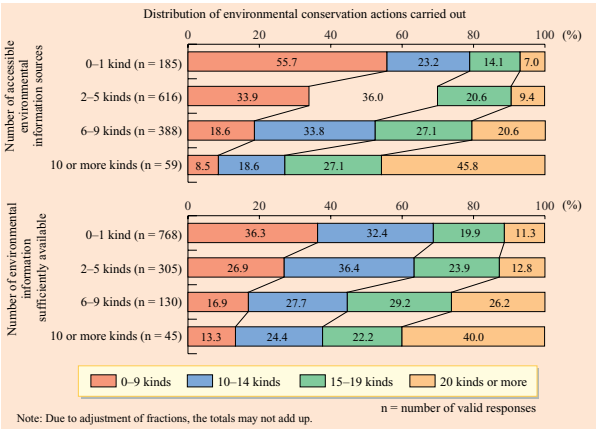
In terms of environmental information, the more

Steps for Concrete Actions and Policy Implementation



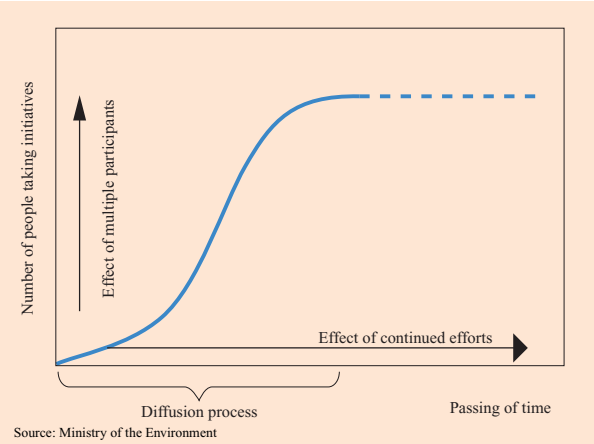
Source: Ministry of the Environment

Influence of Environmental Information on Behaviors



Note: Due to adjustment of fractions, the totals may not add up.
Source: Compiled based on the *Survey of Environment-conscious Lifestyle* (May 2002), Ministry of the Environment

Diffusion of Initiatives Undertaken by Individuals



Source: Ministry of the Environment

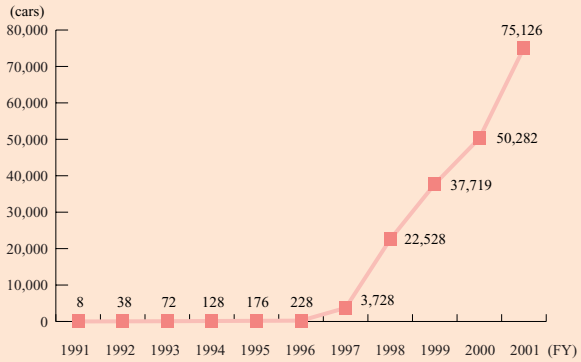
numerous the information sources are and the more substantial the information is, the easier it becomes to facilitate environmental conservation activities. Therefore, a system must be developed to enable the gathering of environmental information, when needed in the format required, such as eco-labeling and green purchasing related information.

3. Individual Efforts Cumulate into a Tremendous Force

Dr. Everett Rogers, an American sociologist, put forward a generalized theoretical model of the process of innovation adoption that shows how new technologies and products are launched in the market and gain acceptance by society. Rogers' model of innovation adoption can be applied to environmental conservation measures such as the purchase of environment-friendly products, including hybrid vehicles, refillable detergents, and products with replaceable parts. When a product fulfills the factors of diffusion such as "obvious environmental conservation effect," "same economical efficiency and functionality as conventional products," "easy application," "trial use possible," and "visible results," more and more people will adopt its use as time goes by. In this way, an individual's action will spread to other people. The completion of the diffusion process means multiple users are contributing in creating an effect, which in turn, when coupled with the continuous effect of the action, will evolve into a common mode of behavior in individuals, thus creating a tremendous impact.

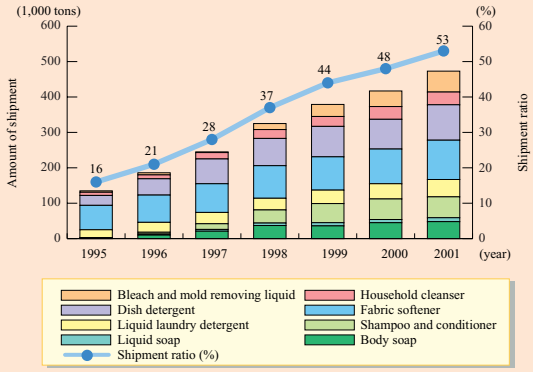
Many environment-friendly products are still in the process of adoption. In order for these products to make further inroads, corporations must develop new technology and design environment-conscious products, and the government must establish a framework and create institutions to assist individual actions so that everyone will continue to select environment-friendly products. The self-initiated and proactive efforts of individuals are the starting point that will bring forth these actions of businesses and government agencies. By each actor influencing other actors and creating a social environment that facilitates environmental conservation activities, such efforts will spread nationwide, creating a remarkable force as a result.

Changes in the Ownership of Hybrid Vehicles



Source: Compiled by the Ministry of the Environment based on data of the Ministry of Land, Infrastructure and Transport

Changes in the Shipment of Refillable Products

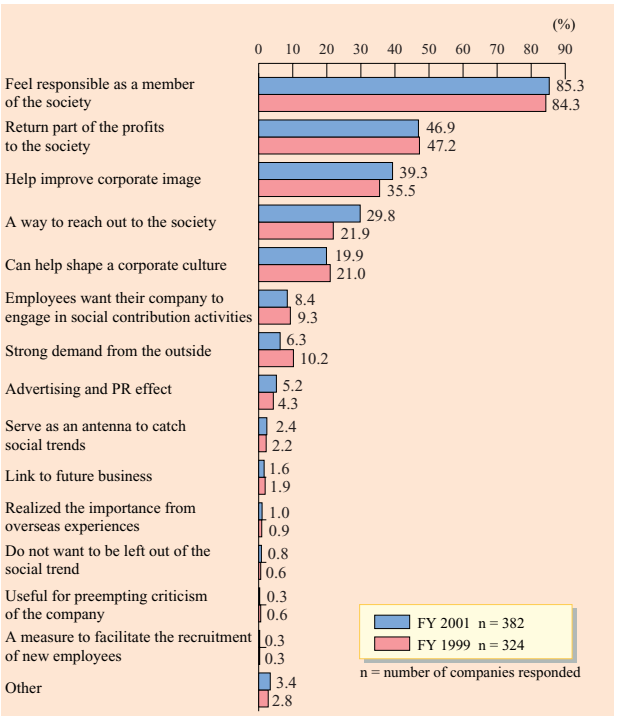


Source: *Environmental Annual* Vol. 27 (FY 2002 edition), Japan Soap and Detergent Association

Section 4: Changes in the Socio-economic System Arising from the Interaction between Individuals and Other Actors

1. Relationship between Individuals and Businesses

Reasons for Businesses to Engage in Social Contribution Activities



Source: Compiled by the Ministry of the Environment based on the *Results of Social Contribution Activities Survey*, Nippon Keidanren

The increased awareness of environmental conservation in recent years has made businesses more responsive to environmental problems. While businesses actively make social contributions in the environmental field, businesses also tend to incorporate environmental considerations into business activities, such as formulating environmental management policy and setting up specific environmental goals and targets. Furthermore, green businesses are also on the rise. It had a market size of 29.9 trillion yen in 2000 and is expected to reach 47.2 trillion yen in 2010 and 58.4 trillion yen in 2020. During this period, the green business workforce is estimated to increase from 769,000 persons to 1.119 million in 2010 and 1.236 million yen in 2020.

Against this backdrop, we can view that proactive measures taken by businesses, such as to supply environment-friendly goods and services and environmental information, and to provide environmental education and learning, lend a great deal of support to the actions of individuals.

For example, eco-labeling represented by Eco Mark is an important source of information for consumers to enable them to exercise consideration for the environmental load of products and select products and services with a smaller environmental load. In tandem with the rapid popularization of green purchasing and procurement, the number of products with such eco-labeling is on the rise.

Due to the fact that the "purchase of a product" is often to "acquire the function" of that product, a business model called "servicizing" which delivers the function of a product is gaining popularity. For example, car-sharing businesses in which members share the use of vehicles are making inroads everywhere. Such services not only directly lower environmental load but also are expected to bring forth a reexamination of our overall lifestyle through changing the way vehicles are owned and used because they account for a great portion of household spending.

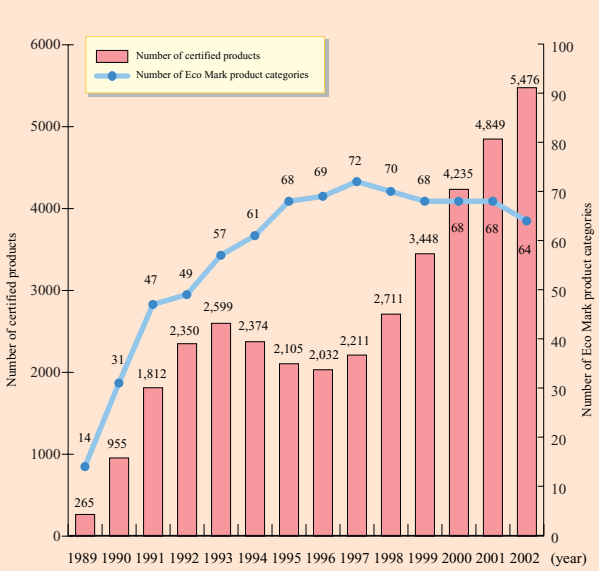
Various stakeholders evaluate businesses from multiple aspects, including the environmental aspect. Businesses are starting to realize the importance of environmental communication. A growing number of businesses are taking initiatives to provide information through the Internet, compile and publish environmental reports, adopt environmental accounting, etc.

Estimation of the Current and Future Market Sizes and Workforce of Japan's Green Businesses

Green business	Market size (100 million yen)			Workforce (persons)		
	2000 (*)	2010	2020	2000	2010	2020
A. Environmental pollution control	95,936	179,432	237,064	296,570	460,479	522,201
Manufacturing of equipment and materials for the prevention of pollution	20,030	54,606	73,168	27,785	61,501	68,684
1. Prevention of pollution	5,798	31,660	51,694	8,154	39,306	53,579
2. Treatment of effluent	7,297	14,627	14,728	9,607	13,562	9,696
3. Treatment of waste	6,514	7,037	5,329	8,751	6,676	3,646
4. Purification of soil and water (including groundwater)	95	855	855	124	785	551
5. Prevention of noise and vibration	94	100	100	168	122	88
6. Environmental measurement, analysis, and assessment	232	327	462	981	1,050	1,124
7. Other	-	-	-	-	-	-
Provision of services	39,513	87,841	126,911	238,989	374,439	433,406
8. Prevention of air pollution	-	-	-	-	-	-
9. Treatment of effluent	6,792	7,747	7,747	21,970	25,059	25,059
10. Treatment of waste	29,134	69,981	105,586	202,607	323,059	374,186
11. Purification of soil and water quality (including groundwater)	753	4,973	5,918	1,856	4,218	4,169
12. Prevention of noise and vibration	-	-	-	-	-	-
13. Environmental research and development	-	-	-	-	-	-
14. Environmental engineering	-	-	-	-	-	-
15. Analysis, data collection, measurement, and assessment	2,566	3,280	4,371	10,960	14,068	17,617
16. Education, training, and provision of information	218	1,341	2,303	1,264	5,548	8,894
17. Other	50	519	987	332	2,487	3,481
Construction, and installation of equipment	36,393	36,985	36,985	29,796	24,539	20,111
18. Equipment for the prevention of air pollution	625	0	0	817	0	0
19. Equipment for treating effluent	34,093	35,837	35,837	27,522	23,732	19,469
20. Facilities for treating waste	490	340	340	501	271	203
21. Equipment for purifying soil and water	-	-	-	-	-	-
22. Equipment for preventing noise and vibration	1,185	809	809	956	536	439
23. Equipment for environmental measurement, analysis, and assessment	-	-	-	-	-	-
24. Other	-	-	-	-	-	-
B. Environmental load reduction technologies and products (manufacturing of equipment and provision of technologies, materials, and services)	1,742	4,530	6,085	3,108	10,821	13,340
1. Environmental load reduction and resource conservation technologies and associated processes	83	1,380	2,677	552	6,762	9,667
2. Environmental load reduction and resource conservation products	1,659	3,150	3,408	2,556	4,059	3,673
C. Efficient use of resources (manufacturing of equipment, provision of technologies, materials, and services, construction, and installation of equipment)	201,765	288,304	340,613	468,917	648,043	700,898
1. Prevention of indoor air pollution	5,665	4,600	4,600	28,890	23,461	23,461
2. Water supply	475	945	1,250	1,040	2,329	2,439
3. Recycled materials	78,778	87,437	94,039	201,691	211,939	219,061
4. Facilities for renewable energy	1,634	9,293	9,293	5,799	30,449	28,581
5. Energy conservation and energy management	7,274	48,829	78,684	13,061	160,806	231,701
6. Sustainable agriculture and fisheries	-	-	-	-	-	-
7. Sustainable forestry	-	-	-	-	-	-
8. Prevention of natural disasters	-	-	-	-	-	-
9. Eco-tourism	-	-	-	-	-	-
10. Other (nature protection, ecological environment, biodiversity, etc.)	107,940	137,201	152,747	218,436	219,059	195,655
Total	299,444	472,266	583,762	768,595	1,119,343	1,236,439

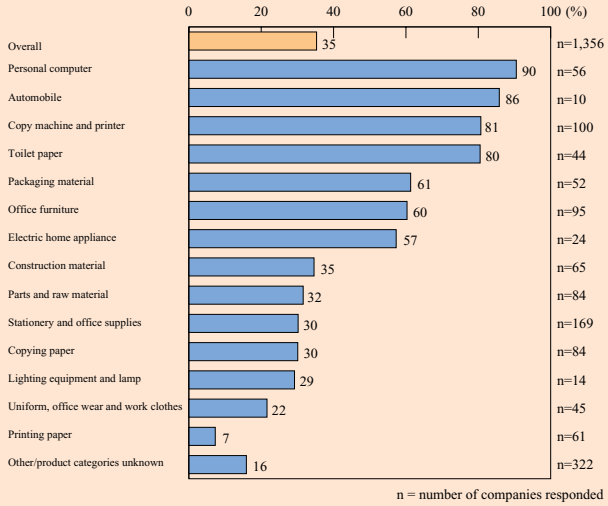
Notes:
1. "-" indicates no data available.
2. Some figures under FY 2000 market size are not from the same fiscal year.
3. Some totals under market size may not add up due to rounding.
Source: Ministry of the Environment

Changes in the Number of Eco Mark Certified Products



Source: Compiled by the Ministry of the Environment based on information from the Japan Environment Association (Eco Mark Office)

Percentage of Eco-friendly Products to Total Sales Volume



Note: Based on a questionnaire targeted to businesses that manufacture and market eco-friendly products in 15 major categories specified in the Law on Promoting Green Purchasing. The figure shows the percentage of sales of eco-friendly products to the total sales volume.

Source: Compiled by the Ministry of the Environment based on *Results of the 7th Green Purchasing Survey*, Green Purchasing Network Secretariat (Survey period: October–November, 2002)

Major Car-sharing Examples in Japan

Name	Feature	Car type	Area	
CEV Sharing	- Japan's first car-sharing business run by a private company - Participated by citizens and businesses (started operation since 2002)	- Low emission car	Yokohama City	In practical use
Car Sharing Network	- Japan's first car-sharing business run by specified non-profit corporation - Participated by citizens and businesses (started operation since 2002)	- Low emission car	Fukuoka City	
Social Experiment on Automotive Transport Fujisawa 2001	- Citizens who commute to train stations by car and businesses that use cars in daytime operations share low-emission vehicles - Co-workers carpool from train stations to the company (2001–March 2002)	- Conventional gasoline-powered car - Low emission car	Fujisawa City (Kanagawa Prefecture)	Experimental stage
Kyoto Public Car System	- Set up stations at seven locations in the city's business, residential and tourist districts - Tourists, citizens and business operators are monitoring members (FY 2000–2002)	- Low emission car	Kyoto City	
Electric Truck Sharing System	- Experiment to share electric trucks for business use - Participated by 80 corporations (December 1999–March 2000)	- Low emission car	Osaka City	
Ebina City Eco Park-and-ride	- Citizens using low-emission cars to commute to work park their cars at parking lots near stations, and businesses in the neighborhood use the cars in daytime for business purposes - Park-and-ride car-sharing method utilizing difference in the time of car use (January–March 2000, November 2000–March 2001)	- Low emission car	Ebina City (Kanagawa Prefecture)	
Electric Car Joint Use Experiment	- In cooperation with car manufacturers, businesses and citizens share low-emission vehicles - About 110 individual members and 18 corporate members (FY 2000–)	- Low emission car	Toyota City (Aichi Prefecture)	

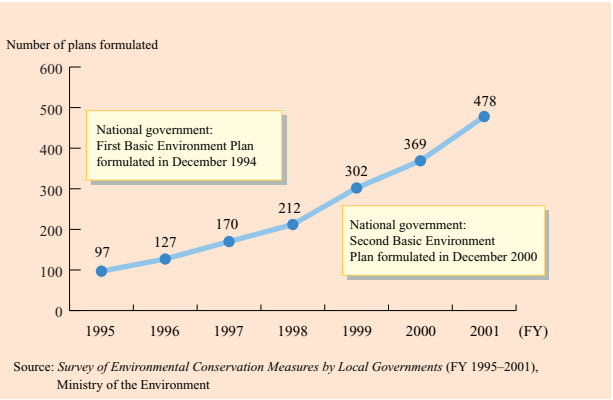
Source: Ministry of the Environment

On the other hand, the active approach of individuals towards businesses adds momentum to the environmental activities pursued by businesses. For example, in addition to a rising interest in the purchase of environment-friendly products in recent years, networks are formed to respond to the needs of these consumers. Coupled with the recognition of businesses for their excellent environmental conservation activities and the appearance of eco-funds, there are movements to evaluate and rank businesses from an environmental point of view, to provide information on the environmental management of companies in job information magazines, etc. All of these factors together will change corporate behavior and eventually transform the socio-economic system into one that is more considerate of the environment.

2. Relationship between Individuals and the Government

The government is an actor who sets up the framework and establishes the foundation of the socio-economic system and influences the action of individuals. Recently, local governments have begun incorporating the role of each citizen into their local basic environment plans, pointing out the need for citizens to change their lifestyles and to pursue environment-conscious way of living. Taking the opportunity of the introduction of local discretionary taxation system for specific purposes, some local governments have introduced environment-related taxes to promote environmental considerations in various aspects of daily life, such as actions that give consideration to conservation of the natural environment, reduction in the use of plastic grocery bags receiving at the cash register, etc. Furthermore, in response to the increase in environmental load that results from the rising demand for automobile use in daily life, the government is building social infrastructure to create an environment to facilitate the use of bicycles, to establish a park-and-ride system, etc. In addition, the government is also putting efforts in developing human resources that can offer specialized knowledge and rich experience, providing consolidated easy-to-use environmental information, and carrying out public relations activities.

Increase in the Number of Local Basic Environment Plans Formulated



Source: *Survey of Environmental Conservation Measures by Local Governments* (FY 1995–2001), Ministry of the Environment

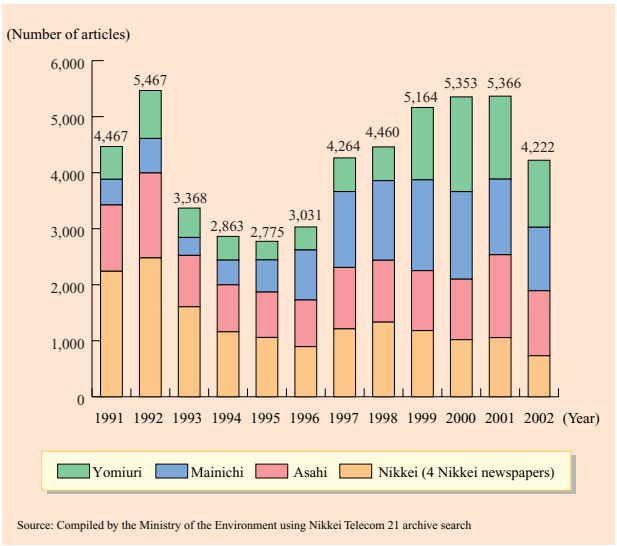
On the other hand, especially at the local government level, it has become possible for individuals to participate actively in the formulation of environmental conservation measures. There are examples that the actions of individuals have influenced public administration, and that citizens and the government have joined forces in implementing such measures.

3. Relationship with Other Actors

Businesses and the government are not the only ones lending support to the efforts of individuals.

For example, the activities of environmental non-profit organizations (NPOs) provide venues for activities in areas closely related to the daily lives of individuals. By realizing the problems that exist in daily life and participating in NPO activities, it is hoped that individuals will help advance the activities of local communities and other actors. The diverse information dispatched by the mass media will help raise environmental awareness, give direction to the way daily activities are conducted, and expand the activity circles in daily life to the whole society. Furthermore, as every individual lives in relation to the people in the surrounding areas such as neighbors, acquaintances, friends and family members, it becomes possible to raise awareness or incorporate daily life measures through the exchange of information with these people.

Changes in the Number of Newspaper Articles on Environmental Issues



Source: Compiled by the Ministry of the Environment using Nikkei Telecom 21 archive search

In this way, the environmental conservation efforts of one individual will promote the activities of other actors, which will in turn stimulate the activities of other individuals, creating a cycle of rippling effect. This chain of movements will eventually accelerate the reformation of the lifestyle of every individual.

Section 5: New Developments towards a Sustainable Society

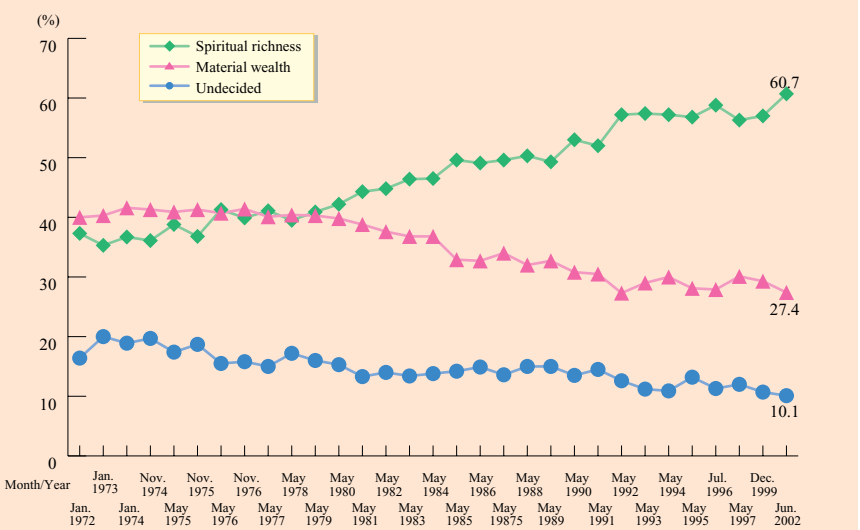
1. Key to the Building of a Sustainable Society

After the period of high economic growth, the number of people in search of spiritual richness rather than material wealth has been consistently on the rise. There is a tendency for people to place priority on an affluent and relaxing lifestyle, the pursuit of leisure activities, self-enlightenment and self-improvement rather than on durable consumer goods. Furthermore, the number of years before replacement of a durable consumer product has increased.

Against this backdrop, several new lifestyles have taken root recently.

For example, "simple life" has become a popular phrase representing a lifestyle that restores spiritual richness. Specifically, a person who is in pursuit of this type of lifestyle proposes the following: (1) leading a life that is surrounded by carefully selected items; (2) paying price in accordance with the value of goods while taking into consideration environmental concerns and possibility of long-term use; and (3) making extra efforts to use goods for a longer period through careful use, repairs and recycling. In order to diffuse this trend further, it is necessary for everyone to view such

Material Wealth or Spiritual Richness



Note:
Spiritual richness: "Having achieved certain level of material wealth, I would like to put emphasis on pursuing spiritual richness and a relaxing lifestyle from now on."
Material wealth: "I would like to continue to keep emphasis on enriching life with material comfort."
Source: *National Opinion Poll on People's Life*, Cabinet Office (June 2002)

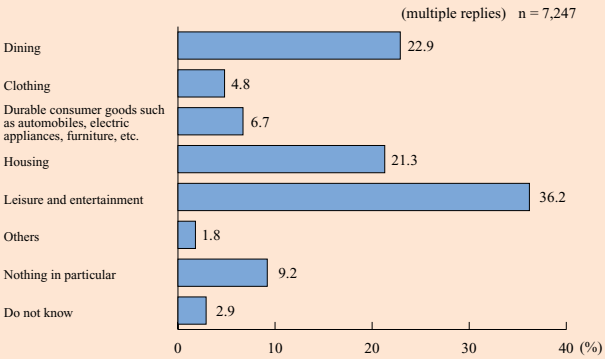
lifestyle as “attractive and cool.”

In addition, the “Slow Food” movement, a movement started in Italy in 1986 that reexamines the eating habit of modern man, is also gaining popularity in Japan. In recent years, as vegetables and other foods are not harvested during the harvesting season, food materials need to be grown in the heated green house and transported in large quantities to distant places where they are consumed. Such changes in eating habits have resulted in an increase in environmental load. The diffusion of the Slow Food movement, which promotes eating rice and local dishes, can reduce the burden on the environment.

2. Steps towards a Sustainable Society

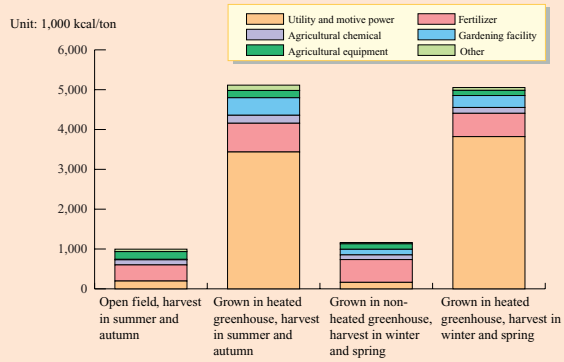
A socio-economic system must be established to enable everyone to choose a sustainable lifestyle. The socio-economic system must be reformed and the awareness and actions of individuals must also be changed at the same time. However, not everyone can take the same path to reach the goal. It is necessary to realize that the changes in awareness and action can create an impetus that can change society. Progress must be made with steady steps.

Areas Where Improvements are Desired



Source: *National Opinion Poll on People's Life* (June 2002), Cabinet Office

Amount of Energy Used for Growing Cucumbers (1990)



Source: Compiled by the Ministry of the Environment based on *Lifecycle Energy in Households*, Japan Resources Association