

## “Clean” Plants: Efforts in the Production Stages

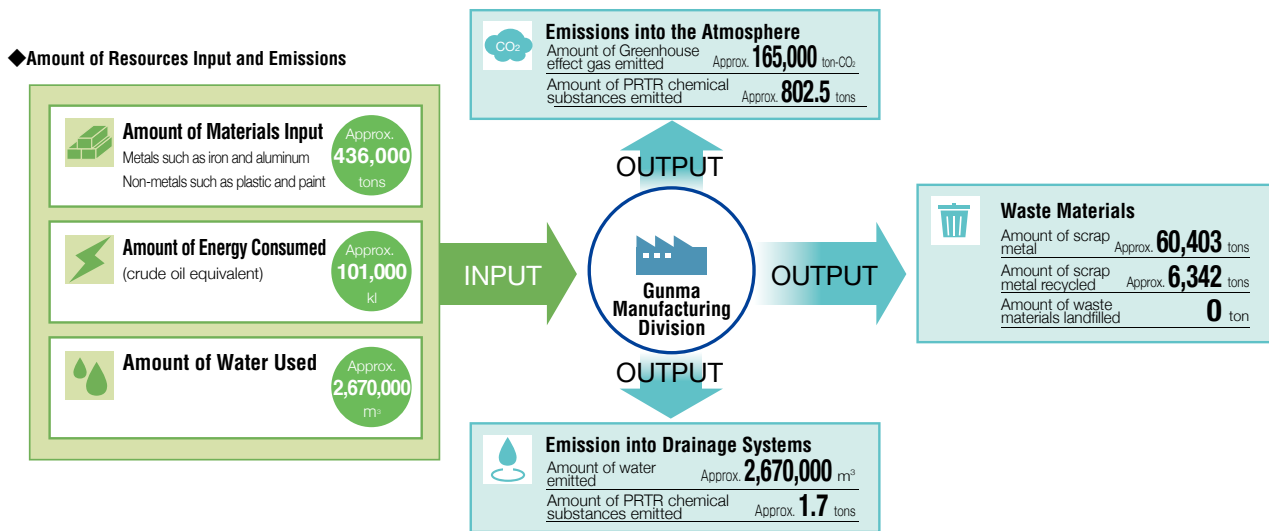
**2007 POINT**

1. We have maintained zero level of waste materials landfilled since 2004.
2. We are actively pressing ahead with EMS establishment at suppliers by approaching to green purchasing.
3. We are pushing forward with global warming prevention by positive efforts to save energy.

▶ See Feature Articles on pp. 7 & 8 for ② and pp. 17 & 18 for ③

## Amount of Resources Input and Total Emissions at Automobile Production (Gunma Manufacturing Division)

This figure shows the amount of resources used and emissions in FY2007 at Gunma Manufacturing Division, Subaru's main automobile production plant in Japan.



## Reduction of Waste Materials

### Outline of Waste Materials Generated and Treated

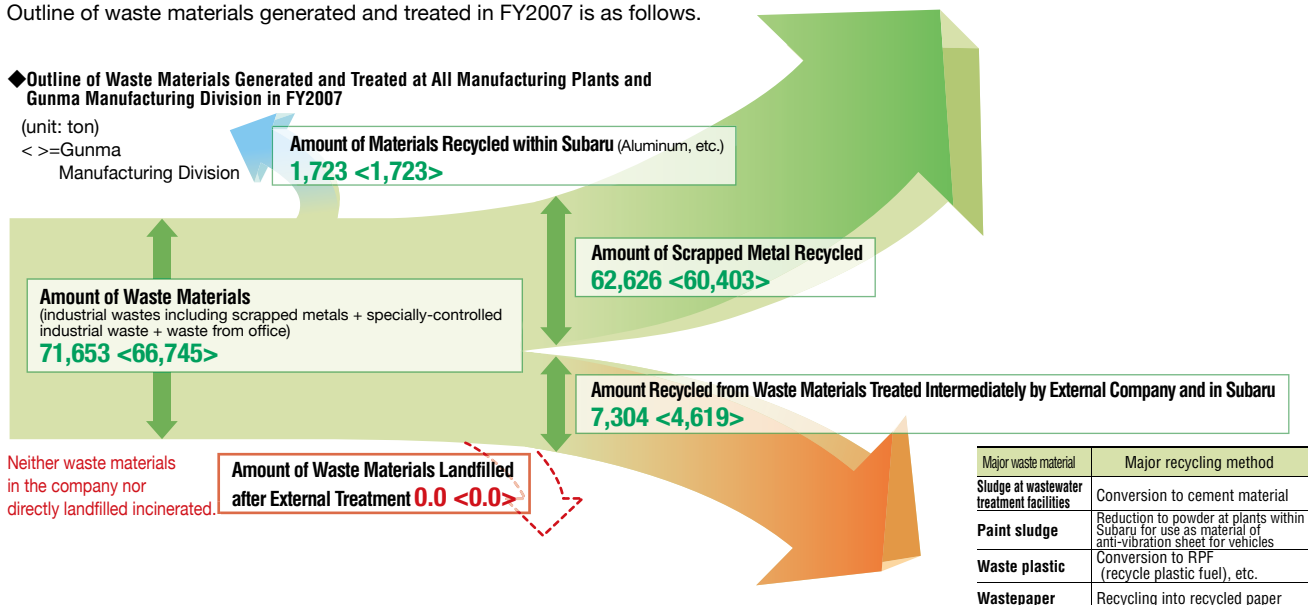
### Zero Level of Waste Materials Landfilled Maintained

Subaru's all manufacturing plants have maintained zero emissions for waste materials since 2004. Outline of waste materials generated and treated in FY2007 is as follows.

### ◆ Outline of Waste Materials Generated and Treated at All Manufacturing Plants and Gunma Manufacturing Division in FY2007

(unit: ton)

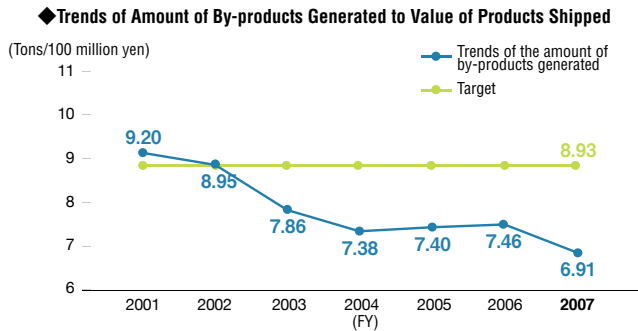
> = Gunma Manufacturing Division



■ Efforts to Reduce Waste Materials

**Achieved the Best Value Ever of By-products Generated to the One of Shipped Products**

Since Subaru considers that the generation of waste materials itself is a “waste”, we have been making a continuous effort to achieve “zero emissions” and to curb the generation of waste materials. We have been striving to effectively utilize resources by improving the yield ratio of raw materials used in the production stages and enhancing coating efficiency at paint factories. The following graph shows the indexes obtained by dividing the ratio of the amount of by-products (scrap metal and non-ferrous scrap metals such as aluminum) generated by the automotive division by the value of shipped products. In FY2007, we got the best result ever; 6.91. Also, we have achieved the target levels (of the amount by-products should be reduced, as determined by the Laws for the Promotion of the Effective Utilization of Resources) every year since FY2003.



**Reduction of Environmental Pollutant**

■ VOC (Volatile Organic Compounds) Generated in Paint Process at Gunma Manufacturing Division

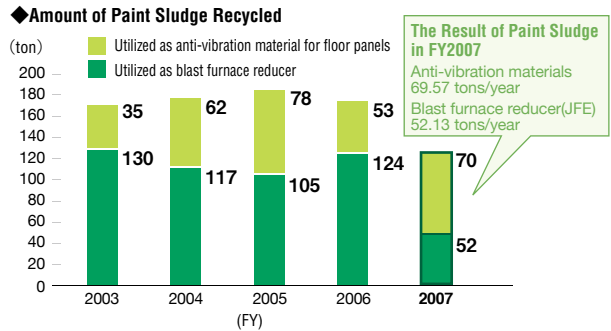
**Target in the FHI Environmental Conservation Program (FY2007 through FY2011) Achieved ahead of Schedule**

The amount of VOC emissions per unit paint area in FY2007 was 63.2 g/m<sup>2</sup>, 30.9% less than that in FY2000, reaching the target in the Environmental Conservation Program (FY2007 through FY2011)<sup>\*1</sup> ahead of schedule. This is mainly due to the switch to water-base paint in the new paint shop and the higher thinner collection rate. We will keep working for further reduction.

As for air and water pollutants, noise and vibration, we set voluntary standards stricter than legally required (in principle, 80% or less than legal standards) keep them under control.

■ Recycling Waste Materials (Paint Sludge)

We found a way to recycle paint sludge from the paint factory. We are recycling paint sludge as anti-vibration materials for vehicle floor panels and as blast furnace reducer. We are also considering recycling it for other uses.



**Conservation of Water Resources**

■ Efforts to Reduce Water Consumption

**The Increase of Production Caused the Rise in Water Consumption**

Total water consumption was about 3,620,000 m<sup>3</sup> at all our manufacturing plants in FY2007 and this is an increase of 7% compared with the previous year.

Although the effort of implementing strict measures such as checking for leakage from water pipes at each manufacturing plant have been done, the rise in water consumption caused by the increase of production has exceeded the effect. We will actively make every effort to reduce water consumption further at all manufacturing plants.

■ Management of Chemical Substances (the PRTR Law)

**Reduced 26 tons of Chemical Substances Subject to the PRTR Law**

Subaru uses 18 chemical substances subject to the PRTR Law. Use of such chemicals at all our manufacturing plants totaled 843 tons in FY2007, achieving a reduction of about 26 tons compared with the previous year. These achievements result from activities such as changing paint used in the vehicle body painting process to water-base one and reducing the amount of thinner for cleansing.

**TOPICS** **Control of Water Pollutants**

At Gunma Manufacturing Division, there is a water quality measuring room for periodical checkups, always ready to take immediate measurements in case of any environmental accident.

Staff at work in water quality measuring room

\*1 The target in the Environmental Conservation Program (FY2007 through FY2011): To reduce the amount of VOC emissions by 30% or more compared to FY2000 by the end of FY2010.

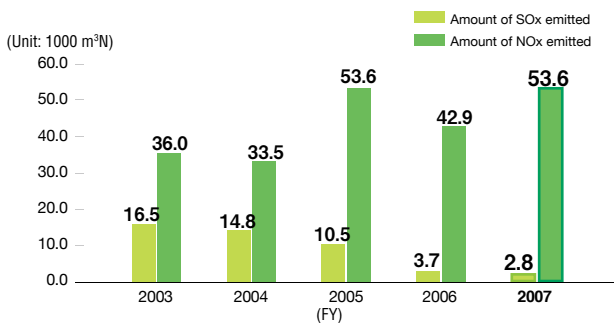
# Clean Plants

## Air Pollutants

### Comply with Voluntary Standards in Both NOx and SOx

Trends in total amount of Nitrogen Oxides (NOx) and Sulfur Oxides (SOx) emitted from specific facilities such as boilers at all manufacturing plants are as shown in the graph. In FY2007, emissions of SOx decreased due to several factors such as the change of boiler fuel from heavy oil to natural gas. Although emission of NOx has increased due to factors like the stop of denitration equipment, periodical measurement results of both NOx and SOx in FY2007 show that our voluntary standards are satisfactory at all locations measured.

#### ◆ Trends in Amount of NOx and SOx Emitted at All Manufacturing Plants

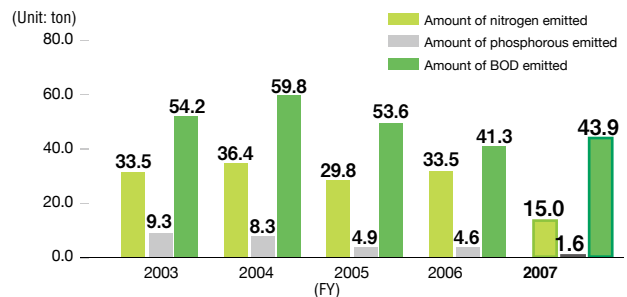


## Water Pollutants

### Seven Cases Have Exceeded Our Voluntary Standards

Trends in the amount of nitrogen, phosphorous and BOD discharged into water at all our manufacturing plants are as shown in the graph. In FY2007, the results of periodic measurements show that seven cases have exceeded our voluntary standards. For cases of other substances in violation of limits including our voluntary standards, please see "The Number of Cases Where Limits Set in Environment-related Laws were Exceeded and Details" on p. 38.

#### ◆ Trends in Amount of Nitrogen, Phosphorous and BOD Emitted at All Manufacturing Plants



For more details on the results of periodic measurements, please see our Supplementary Volume for Data on our website.

## Preventing Soil and Underground Water Pollution

### Continuously Conducting Underground Water Sampling Surveys

Subaru has voluntarily conducted soil and underground water surveys at all manufacturing plants since 1998 and has reported the results to the government. We are continuously conducting sampling surveys of underground water even at manufacturing plants where purifying measures for soil and underground water have already been taken, such as the Utsunomiya Manufacturing Division, and continue to report the results to the government.

## Storage of Equipment Containing PCB

### Control Equipment Containing PCB Properly

Subaru stores PCB appropriately and notifies the authorities of possession of PCB in accordance with the related laws and regulations every year. Regarding the equipments (such as transformers and condensers) we store that contain a high concentration of PCB, we already applied and registered for their disposal with the Japan Environmental Safety Corporation (JESCO) in March 2006.

## Efforts in the Production Stages at Affiliated Companies

### SIA: Zero Emission



Ms. Rebecca Bright receiving the plaque of the award from Mr. Matt Hale, EPA (right)

SIA, Subaru's auto-assembly plant in the U.S., achieved zero waste material directly landfilled in 2004 and has continued to maintain its status since then. SIA improved to a 99.8% recycling rate in FY2007, higher than previous year (99.6%). Being recognized for these efforts, SIA's environmental efforts were featured in a segment on CNBC's television show in July, 2007, and in an article in *USA TODAY* in January, 2008.

Also, in November, 2007, SIA received the Environment Protection Agency (EPA) Waste Wise Award for two years in a row (Gold Achievement; Industrial Material Recycling in 2007).

For efforts of our affiliated companies, please see our Supplementary Volume for Data on our website as well.

### Information Exchange on Environmental Conservation with Affiliated Companies

Subaru convenes the Domestic Affiliated Company Subcommittee and the North American Environmental Committee each twice a year.

At these committees, the members disclose each other case examples and performances in their dealings with global warming prevention, energy saving, wastes reduction and pollution prevention to step up the group-wide environmental conservation activities.



Domestic Affiliated Company Subcommittee

North American Environmental Committee



## Honored with Prefectural Governor Award

### Excellent Company in Pollution Prevention

The Utsunomiya Manufacturing Division received the Prefectural Governor Award "Excellent Company in Pollution Prevention" on September 10, 2007.

This demonstrates that our everyday efforts to prevent environmental pollution in facilities as well as their operations and management have been acknowledged. We were the only recipient of the Award in the prefecture.



Matsumoto, General Manager of General Administration Dept. and the commendation of the award



## Environmentally Friendly Logistics

**2007  
POINT**

1. Subaru Logistics Co., Ltd, has been involved in activities to reduce materials by reusing packaging materials.
2. We contribute to reducing environmental burdens by the cooperative transports of completed vehicles and promoting modal shifts.

### Efforts by Subaru Logistics Co., Ltd and Subaru

#### ■ Reuse of Packaging Materials

##### Approaches to Reduction of Foam Materials for Packaging of Overseas Knockdown Parts

The Production Logistics Division of Subaru Logistics Co., Ltd, which handles packing designs for knockdown parts has been involved in activities to reduce environmental burdens primarily focusing on the reuse of packaging materials.

They started a project to reuse styrene foam packaging materials for engine parts in the second half of FY2005 and put the reuse into practice the first stage from March, 2006 and the second stage from December, 2007.



Packaging materials

#### ■ Increase Efficiency in Transportation

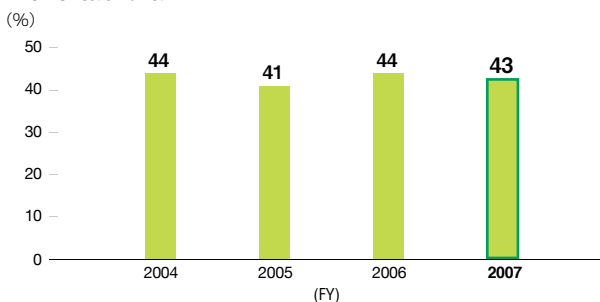
##### Reducing Environmental Burdens Caused during the Transportation of Completed Vehicles

We have contributed to reducing environmental burdens caused during the transportation of completed vehicles, by improving transportation efficiency through such means as setting optimum standard transportation routes, promoting modal shifts and improving carrying efficiency.

#### ■ Modal shift

Subaru vehicles are sent from its assembly plants in Gunma Prefecture to dealers nation-wide. As for the transports to Sendai and to the north as well as to Osaka and to the west, sea transports are used. The sea shipments accounted for 43.2%\* of the total domestic transportation of completed vehicles in FY2007.

#### ◆ Change in Ratios of Sea Transport to Total Transport of Subaru Completed Vehicles for Domestic Market

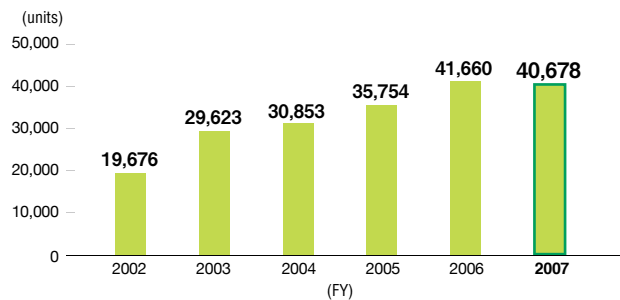


\*Number of units shipped out of the plant gates, excluding units for export

#### ■ Cooperative Transports

In FY2007, by promoting the cooperative transports of completed vehicles with other companies in the same industry, the total of consigned-to and consigned-from vehicles was 40,678, and the company maintained the same level of the total number of completed vehicles carried as the previous fiscal year even though the total shipped units has decreased.

#### ◆ Trends in the Number of Vehicles Carried Through Cooperative Transports



#### ■ Approached to the Revised Law Concerning the Rational Use of Energy

In FY2007, as means to cope with the Revised Law Concerning the Rational Use of Energy, we promoted the installation of the highly functional digital tachograph, idling stop device and eco tires. Meanwhile, continuous efforts have been made to accurately grasp energy consumption and CO<sub>2</sub> emissions by collecting data on travel distances and fuel consumptions periodically from cooperative companies.

We will continue working to reduce the energy consumption per sales by 1% or more annually.





# Automobile Recycling

## How to Make Effective Use of Limited Resources

2007  
POINT

1. Working together with four ART car manufactures, we have mapped out the Harness design guidelines.
2. We achieved the goals set by JAMA for VOCs in vehicle interiors of the New Impreza and the New Forester.
3. We promote the higher recycling rate by releasing the “Information on Removal of Copper Containing Parts in End of Life Vehicles.”

## Recycling Activities

Subaru has established the Automotive Recycle System of Subaru (ARSS<sup>\*1</sup>) as part of active efforts to recycle and properly dispose of end-of-life vehicles (ELVs<sup>\*2</sup>), according to the Japanese End-of-Life Vehicles Recycling Law (hereinafter referred to as the ELVs Recycling Law) which came into force on January 1, 2005. The recycling ratio of ASR in FY2007 was 72.9%, satisfying the Japanese legal standard required for FY2015 (The recycling ratio of ASR: 70% or higher). We will continue efforts to keep the recyclability of Subaru automobiles at a constantly high level, as well as aim at further efficiency improvements and low-cost recycling in order to minimize the recycling fee paid by our customers.

## Efforts in the Design Stage

### ■ Emphasis on Design Allowing Easy Recycling

#### Promote Car Design Considering Recycling

##### ■ Recycling Market Research

The Recycling Design Project Team members continuously visit dismantlers, shredding companies, and waste disposers in various parts of Japan to exchange views on the current and future market trends for actual ELV treatment. The results are used to determine the principles for designing automobiles with due consideration for recycling and extract specific subjects for future research.

##### ■ Efforts to Improve Recyclability

###### <Advances in Wire Harness Dismantling>

Because a large amount of copper is used in a wire harness, if the wire harnesses can be removed before the ELVs are shredded, the collection and separation of iron and copper will be enhanced and their value in terms of resource recycling will increase. Subaru is conducting studies for a harness layout and automobile structure that make it possible to effectively collect more copper and in a shorter time. We worked on the establishment of harness design guidelines with ART in FY2007.



Advances in wire harness dismantling

###### <Easier Material Identification>

It is most important that the material of each part can be recognized easily when we recycle. Subaru started to identify the type of material on plastic parts in 1973 even before guidelines for the industry were established. Material identifications had been attached on the rear side of each part before. However, the position was changed, as we believed we could avoid such wasteful actions as dismantling a part to confirm the material type. Subaru has changed the identification positions on all car models, including the Legacy, Impreza, Stella and Exiga since 2001.



An example of the material indication: "PP" means polypropylene

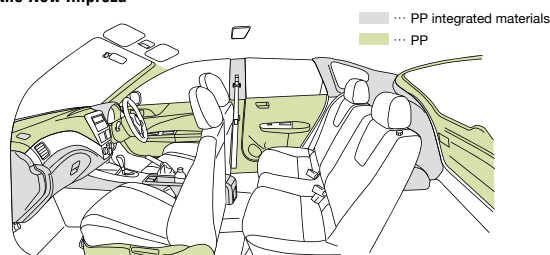


Now the material type can be seen without dismantling the bumpers.

###### <Using Materials that are Easy to Recycle>

We are using olefin resin, which is extremely easy to recycle, as the resin material for the interiors and exteriors of most new and remodeled vehicles. In particular, we are using integrated materials dedicated for use with bumpers for bumpers and integrated materials dedicated for use with interiors for interior parts.

##### ◆ Using Integrated Materials for Interior Parts: Olefin Resin in the New Impreza



\*1 ARSS: Automotive Recycle System of SUBARU  
\*2 ELV: End of Life Vehicles



■ **Efforts to Improve Proper Disposal**

ELVs Recycling Law also regulates the proper disposal of substances with environmental impact, particularly fluorocarbons (refrigerants for air conditioners) and airbags. Concerning future vehicle development, Subaru recognizes the essential need to produce vehicles that can be disposed of more easily.

<Reduction of Fluorocarbons Used in Air Conditioners>

Subaru uses a substitute fluorocarbon, HFC134a, for refrigerants in air conditioners, which does no harm to the ozone layer, but which is still believed to accelerate global warming. We are conducting active countermeasures to reduce the amount of HFC134a and the leakage while using air conditioners and also research into substitute refrigerants other than fluorocarbons. ▶ See p. 17

<Advances in Airbag Disposal>

Airbags and pretensioner seatbelts contribute significantly to reducing the shock to drivers and passengers in automobile accidents. On the other hand, the vast majority of automobiles are put out of service with unused airbags. Because automobile manufacturers are asked to dispose of airbags and similar products under the ELVs Recycling Law, we are conducting research into the optimal structure for airbags, including related components, that will make it safer and easier to activate them in automobiles and subsequently dispose of them.



■ **Reduction of Substances of Environmental Concern**

**Expansion and Continuation of Reduction Activities**

Based on the Japan Automobile Manufacturers Association (JAMA)'s voluntary action programs, we have been working to reduce the four substances of environmental concern (lead, mercury, cadmium and hexavalent chromium) and are partially moving ahead of schedule. In FY2007, bearing shell & bush and machining aluminum made of lead compounds were changed lead-free, while applying lead-free soldering afresh to part of seat belts and door mirrors in addition to the airbag sensors, antenna, speakers and car navigation system of which soldering were already switched lead-free, thus gradually widening the use of non-lead solder.

◆ **Reduction Targets and JAMA's Voluntary Action Program for New Models**

Substance	Target (period achieved)	Details of Reduction Efforts:
<b>Lead</b>	Since Jan. of 2006	Reduce the amount per vehicle produced to less than 1/10 the 1996 levels
<b>Mercury</b>	Since Jan. of 2005	Use prohibited except in a few applications (e.g., minute amounts in discharge headlights and in the liquid crystal panels of GPS systems)
<b>Hexavalent chromium</b>	Starting in Jan. of 2008	Use prohibited
<b>Cadmium</b>	Since Jan. of 2007	Use prohibited

■ **Reducing VOCs in Vehicle Interiors**

**Make the Environment in Vehicle Interiors More Comfortable**

In order to reduce the use of VOCs such as formaldehyde and toluene, which can cause nose and throat irritation, we are revising whether to make changes to the components and adhesive agents used in vehicle interiors. In the New Impreza and the New Forester of FY2007, we achieved the goals set by JAMA<sup>\*3</sup> by reducing the concentration of the 13 substances defined by the Ministry of Health, Labour and Welfare in Japan to levels below the figures set in the guidelines for interior concentration. We have achieved the goals ahead of schedule in the Stella of FY2006 as well, and in the future, we will continue our efforts to reduce the levels of such substances to below the figures set in the guidelines to make the environment in vehicle interiors more comfortable.

**Processing of End of Life Vehicles (ELV)**

■ **Information Disclosure on Removal of Copper Containing Automotive Parts in End of Life Vehicles**

**Approaches to "Total Recycling of Resources"**

Subaru has formulated the "Information on Removal of Copper Containing Parts in End of Life Vehicles" to further bolster the recycling rate of ELV, which is open to the public in the website of ART. (Japanese only)

Currently, a method called "Total Recycling of Resources" is employed as a means to improve the recycle rate without generating ASR in recycling cars.

This involves throwing stripped end of life vehicles into an electric furnaces or the like to melt its iron contents for re-commercialization as construction materials and others. Parts, the source of ASR, are burned in the furnace to be used as heat source (thermal recycle), eliminating the landfill process.

Before implementing this "Total Recycling of Resources",

minimizing the copper contents in the stripped vehicle scraps is required to keep quality in the resulting steel products. For this minimization, how to remove copper containing parts efficiently and thoroughly becomes the vital issue.

The focus of the "Information on Removal of Copper Containing Parts in End of Life Vehicles" is on the disclosure of information on past production vehicles which currently constitute the most part of ELV population.

Formulating the information on the Legacy domestically sold in 1994 and the Vivio domestically sold in 1993 was completed in FY2007 and released for public review in May, 2008.

In addition, working together with four ART car manufactures, we have mapped out the "Design Guidelines for Recycling Harness in Cars" to facilitate the disassembly of wiring harness and related parts, which is now accessible in the website of ART. (Japanese only)

<sup>\*3</sup> Voluntary target: to reduce interior concentration of the 13 substances identified by the Ministry of Health, Labour and Welfare to levels equivalent to or lower than the figures stipulated in the guidelines for new vehicle models (produced and sold in Japan in 2007 and afterward) under the Voluntary Approach in Reducing Cabin VOC Concentration Levels initiated by JAMA.

## Approaches to “Green Dealer Outlets”



1. We have been promoting remedial actions, taking up environmental compliance items.
2. We are working on the reduction of energy consumption and CO<sub>2</sub> emissions to prevent global warming.
3. In November, 2007, Hokuriku Subaru Corporation newly acquired the certification of ISO 14001.

## Promotion of Recycling in the Sales and Service Activities Stage

### Collection of the Scrapped Bumpers

#### Recycle Scrapped Bumpers for Use in Other Parts

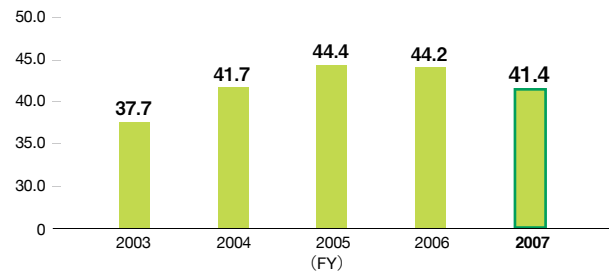
Subaru established an in-house system in 1973 to identify the materials used in plastic parts, ahead of the timetable for industry guidelines for the establishment of such systems. This system is very helpful when the company collects bumpers which are scrapped and changed for repairs to recycle for use in other parts of vehicles. In FY2007, we collected 41,412 scrapped bumpers from all over Japan, which is 93.6% toward the previous year (44,242). The scrapped bumpers were recycled for use in other parts of Subaru as shown in the right graph.

### Parts Produced from Scrapped Bumpers

Models	Parts
R1, R2, PLEO	Universal joint cover Underfloor cover
SAMBAR	Air guide Engine cover
LEGACY	Under spoiler Battery pan Rear skirt Apron
IMPREZA	Trunk trim

### Trends in Number of the Scrapped Bumpers Collected

(unit: thousand)



## Approaches by Dealers

### Improvement Activities at Dealer Outlets

They have been promoting inspection and remedial actions, taking up four main environmental compliance items: Wastes Disposal Management, Water Pollution Prevention, Fire-prevention Control and Chemicals Management.

All the outlets have already been inspected and are now taking corrective actions.

### Global Warming Preventative Measures by Dealers

Focusing on global warming prevention which is a main environmental issue in recent years, we are vigorously pressing on in the following two areas.

1. Energy saving and grasping energy consumption and CO<sub>2</sub> emissions
2. Participation in “Team Minus 6%” – a national campaign against global warming

\*As of January, 2008, the following six dealerships have registered their participation. Yamagata Subaru Co., Ltd., Fuji Subaru Co., Ltd., Shiga Subaru Co., Ltd, Osaka Subaru Co., Ltd., Higashi Shikoku Subaru Co., Ltd. and Minami Kyushu Subaru Co., Ltd.

\*1 sub-dealer: Outlet which sells Subaru vehicles which are supplied not directly from Subaru, but from a Subaru dealership.

### ISO 14001 Certification Acquisition Status

In November, 2007, Hokuriku Subaru Corporation acquired the certification of ISO 14001, becoming the 7<sup>th</sup> Subaru dealership.

(ISO 14001-certified dealerships)

Chiba Subaru Inc., Aomori Subaru Co., Ltd., Fuji Subaru Co., Ltd., Osaka Subaru Co., Ltd., Niigata Subaru Co., Ltd., Subaru Kumamoto Corporation and Hokuriku Subaru Corporation (in the order of certification)

### Environment-related Educational Activities

Serialized educational articles are printed in PR magazines “SUBARU DAYORI” for sub-dealers\*<sup>1</sup> who handle Subaru vehicles to deepen their understanding on environmental activities.

