10 questions

about automobile recycling in Japan





Protecting the environment, reducing waste, and reusing resources through automobile recycling

All the passenger cars and commercial vehicles we drive eventually complete their lifespans and go out of service as end-of-life vehicles (ELVs). But because ELVs contain valuable, useful resources like metals and parts, their owners used to sell them to recycling businesses.

Late in the 1990s, however, the risks of natural resource depletion, global warming and landfill shortage emerged as serious social issues, and Japan introduced recycling frameworks for various industrial products in hopes of evolving our country into a recycling-oriented society.

As part of this public movement, the national-scale automobile recycling system was put into effect in 2005 with the auto users, makers, importers and industry participating as responsible players. Ever since the percentage of ELVs treated in the recycling system has increased at a steady pace.

- **Q1.** Framework of the recycling system?
- **Q2.** Background to the recycling system?
- **Q3.** Features of the recycling system?
- **Q4.** Operations financed by recycling fees?
- **Q5.** Flow of ELVs in the recycling system?
- **Q6.** Current status of ELV recycling?
- **Q7.** What are the "recycled parts" ?
- **Q8.** Brakes on dumping and neglect?
- **Q9.** Easier-to-recycle designs?
- Q10. Vehicle destination data?

Doctor Recycle: "I' II answer all the questions."



Q1. Framework of the recycling system?





The automobile recycling system is designed to reduce wastes and recover useful resources from end-of-life vehicles by making use of the existing recycling industry. The players include vehicle users, automakers, auto importers, ELV collectors, fluorocarbon retrievers, dismantlers and shredding operators, and their roles and responsibilities are clearly defined for the automobile recycling system.



Automobile recycling Japan model

Q2. Background to the recycling system?



Millions of end-of-life vehicles generated every year all contain metals, parts and other valuable resources. So ELVs were sold and bought among dismantlers and shredding operators for a long time. Late 1990s, however, the risks of natural resource depletion, global warming and landfill shortage loomed as serious social issues. From around 2000, Japan developed recycling frameworks for major industrial products in hopes of evolving into a recycling-oriented society. In 2002, the automobile recycling framework was designed within the law known as ELV Recycling Act, and the automobile recycling system was put into operation from January 2005.

KEYPOINTS

Landfill shortage and improper ELV treatment

There was a rapid diminishing of landfills for automobile shredder residue ("ASR"), the final ELV waste after the recovery of recyclable parts, metals and materials. As a result expenses for ELV disposal climbed, and illegal practices of ELV dumping and piling spread widely in Japan.



Charged for an ELV instead of selling it for profit

Compounded by a dive in scrap iron prices, ELV recycling becameno longer profitable, forcing the dismantlers and shreddingoperators to stop buying ELVsfrom the users. Instead, they began to charge fees for their ELVdisposal services.



Growing concerns for the environment and safety

Because of the escalation of illegal disposals, there was no progress in the public efforts to make harmless the fluorocarbons used for car air-conditioning and to remove the airbags safely from ELVs against explosion risks.



Q3. Features of the recycling system?



Vehicle users required to pay recycling fees

Under the automobile recycling system, vehicle users are required to pay a fee for the proper treatment of ASR, airbags and fluorocarbons--the three items whose recycling is difficult on a commercial basis. In principle, the fee must be paid when the user buys a car. When a car ends its service life, this ELV must be handed over to a collector (e.g. auto dealer, repair shop).

The automaker or auto importer sets the recycling fee for each car on the basis of car model, airbag count, refrigerant type, etc. Recycling fees currently range from about ¥6,000 to ¥18,000 per car, including the expenses for information and fund management by JARC.

ASR fee	Approx. ¥6,000~¥18,000		
Airbag fee			
Fluorocarbon fee			
Info management fee	¥130		
Fund management fee	¥290*		
* ¥410 when paid at time of ELV collection			

Registration or licensing mandatory for recycling operators

To be players in the automobile recycling system, ELV collectors, fluorocarbon retrievers, dismantlers, and shredding operators must be registered or licensed by the designated local government. Their responsibilities are to receive ELVs, send them down to the next play in the recycling channel, and finally deliver the recovered ASR, airbags and fluorocarbons to the automakers or importers.

The world's first electronic management of recycling

Japan's automobile recycling system is supported by an unprecedented scheme of managing the flow of ELVs using a computer network and e-manifests. If information is missing concerning the flow of some ELVs in the recycling channel, JARC searches and locates and also reports on the ELV mishap to the designated local government.



Overall flow of end-of-life vehicle recycling

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Q4. Operations financed by recycling fees?



The recycling fees paid by vehicle users are spent on the recycling and proper disposal of ASR, airbags and fluorocarbons by automakers and auto importers.

Automobile Shredder Residue (ASR)

ASR is the final ELV shreds left after the recovery of reusable parts and metals. Consisting mainly of plastic and rubber shreds, ASR was mostly dumped into landfills before the days of the automobile recycling system. Today, however, efforts are continuing to reduce ASR emissions by tapping the last useful materials from ASR and using the final ASR as a fuel.



Airbags

"Airbags", which also include seat pretensioners, are devices for protecting the occupants from the injurious impacts of crash accidents. Because of their explosion risks during recycling operations, airbags need to be removed safely by expert workers in an early stage of ELV recycling. Metals are recycled from removed airbags.



Fluorocarbons

Fluorocarbons are in wide use as refrigerant for car air-conditioning, but must be prevented from escaping into the atmosphere since they are known to cause ozone layer destruction which in turn accelerates global warming. It's the responsibility of automakers and auto importers to retrieve fluorocarbons from ELVs and make them harmless through thermal decomposition.



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Q5. Flow of ELVs in the recycling system?



Using the recycling fees paid by vehicle users, automakers and auto importers recycle and properly dispose of ASR, airbags and fluorocarbons. Remaining parts and materials of ELVs are recycled by dismantlers and shredding operators on a commercial basis. As a result an overwhelming portion of each ELV is recycled while practically no portion of the ELV is dumped into a landfill today.



Q6. Current status of ELV recycling?



Answer.6

The recycling rate of ASR has been improved by the efforts and ideas of people involved in ELV recycling. The weight of ASR remaining after collecting usable parts as well as ferrous and non-ferrous metals from ELVs (approximately 3.04 million units / year) was 550,967 tons (approximately 2.96 million units) per year. By returning this to raw materials and reusing it as a source of energy, we were able to reduce the final disposal amount to 18,793 tons per year.



Q7. What are the "recycled parts" ?



In the Japanese recycling industry, recycled parts are grouped into "reusable parts" and "rebuilt components" .

"Reusable parts" go through visual and instrumental checks before they are cleaned, beautified, and sold as used parts. "Rebuilt components" are the units reassembled using both recovered parts and new parts, inspected with testing instruments, and sold as used components. These reusable parts and rebuilt components, often used as replacement parts for vehicle maintenance and repair, are contributing to the conservation of resources and the reduction of waste.



KEYPOINTS

These are the advantages of using recycled parts:

Environmental Waste emissions and energy consumption are reduced.	Economical	Their prices are lower than the prices of new parts.
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Q8. Brakes on dumping and neglect?

Answer.8

Since the start of the automobile recycling system, the number of illegally dumped or piled ELVs has dropped phenomenally.

Records of illegal ELV dumping and piling

Year	End of Sep. 2004	End of Mar. 2022
Illegally dumped ELVs	22,499 units ——	\rightarrow 752 units
Improperly piled ELVs	195,860 units ——	→ 4,529 units
Total	218,359 units	> 5,281 units

Illegal dumping (past examples)

- Dumping site: in Sapporo, Hokkaido
- Survey period: 1 Nov.~15 Dec. 2007
- Dumped item: ELVs, dismantled bodies
- Dumped amount: 199.6 tons





Source: Government council

- Dumping site: in Amami, Kagoshima
- Survey period: 7 Jan.~14 Feb. 2008
- Dumped item: ELVs, dismantled bodies
- Dumped amount: 330.0 tons







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Q9. Easier-to-recycle designs?



To facilitate the dismantling and recycling of end-of-life vehicles, automakers and auto importers aim to incorporate easily recyclable materials and easily strippable designs into their cars. They also supply the dismantlers with ISO-compatible airbag deployment tools for safe and speedy airbag recovery. In addition, the HFC-134a air-conditioning refrigerant (Global Warming Potential 1,430) is being replaced by a far more environmentally friendly HFO-1234yf (GWP 1).



Source: Japan Automobile Manufacturers Association, Inc.



Q10. Vehicle destination data?



In FY2021, recycling fees for 4.22 million new vehicles were deposited by the vehicle owners, while 3.04 million ELVs were generated and 1.46 million used cars were exported from Japan in that year. The average service life of passenger cars stood at 16.4 years in FY2021 --notably 4.4 years longer than the average service life recorded in FY2005.



<Vehicle distribution situation data>

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