10 questions

about automobile recycling in Japan

Japan Automobile Recycling Promotion Center (JARC)

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).
Because ELVs contain useful metals and parts with high resource value, they have been recycled in the process of distribution through trade between businesses.

Meanwhile, in the late 1990s, there has been growing concern about the future due to the depletion of natural resources, global warming issues and the tightening of final disposal sites. Amid rapid progress in building a social framework to solve these problems and realize a "recycling-oriented society", the "Automobile Recycling System" began operating in January 2005.

Currently, the automotive industry, including users and manufacturers, are working together to promote recycling efforts. As a result of these recycling efforts, most ELVs are recycled.

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?

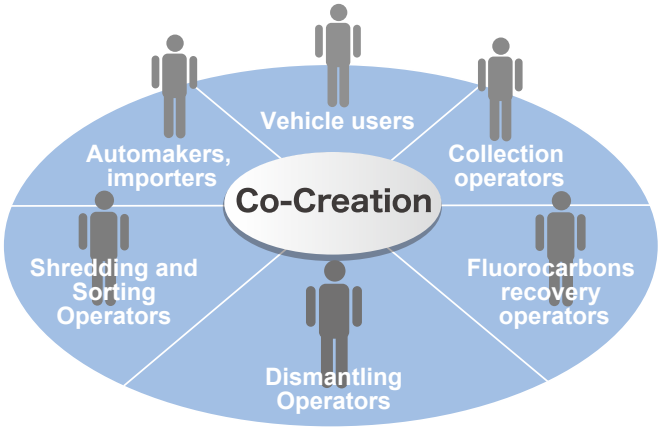
Q10. Vehicle destination data?

Dr. Automotive Recycling
The official mascot, Dr. Automotive Recycle, will answer your questions.

Q1. Framework of the recycling system?

Answer.1

The automobile recycling system is designed to reduce wastes and effectively use resources by clarifying the roles of users, Automakers/ Importers, Collection operators, Fluorocarbons recovery operators, Dismantling operators, and Shredding and sorting operators, while leveraging the existing end-of-life vehicle recycling industry base.



Automobile recycling Japan model

Q2. Background to the recycling system?

Answer.2

Since end-of-life vehicles (ELVs), which are discharged account for approximately 4 million vehicles per year (around 2002), contain useful metals and parts and are highly valuable as resources, they were being recycled through trade among dismantling and shredding companies.
Since the late 1990s, amidst growing concerns about the future due to the depletion of natural resources, global warming, and the tight supply of final disposal sites for waste, a social framework for the realization of a "recycling-oriented society" has been rapidly developed since around the year 2000.
Under these circumstances, Act on Recycling of End-of-Life Automobiles (commonly known as the Automobile Recycling Law) was enacted in July 2002 as the fifth individual law based on “Basic Act on Establishing a Sound Material-Cycle Society” , and the operation of the automobile recycling system was launched in 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

In order to properly recycle and dispose of end-of-life vehicles, it was required to ensure the destruction of fluorocarbons used as a refrigerant in the air conditioners, which have an impact on global warming, and to remove and properly dispose of airbags, which require specialized skills.

Q3. Features of the recycling system?

Answer.3

▶ Vehicle users required to pay recycling fees

Users pay a recycling fee when they purchase a car. The recycling fee is used by manufacturers and importers to properly recycle and dispose of three items: ASR dust, airbags, and fluorocarbon.

The amount of the recycling fee is set by the manufacturer/importer on a per-vehicle basis (6,000 to 18,000 yen per vehicle), depending on the "type" of vehicle, the number of airbags, the type of refrigerant in the car air conditioner, etc.

In addition, there is an "Information management fee" and a "Deposit management fee," which are necessary for operating the automobile recycling system.

ASR fee	Approx. ¥6,000~¥18,000
Airbag fee	
Fluorocarbon fee	
Info management fee	¥130
Depo management fee	¥290*

* ¥410 when paid at time of ELV collection

The user is also responsible for delivering ELVs to Collection operators such as car dealer or a maintenance shop.

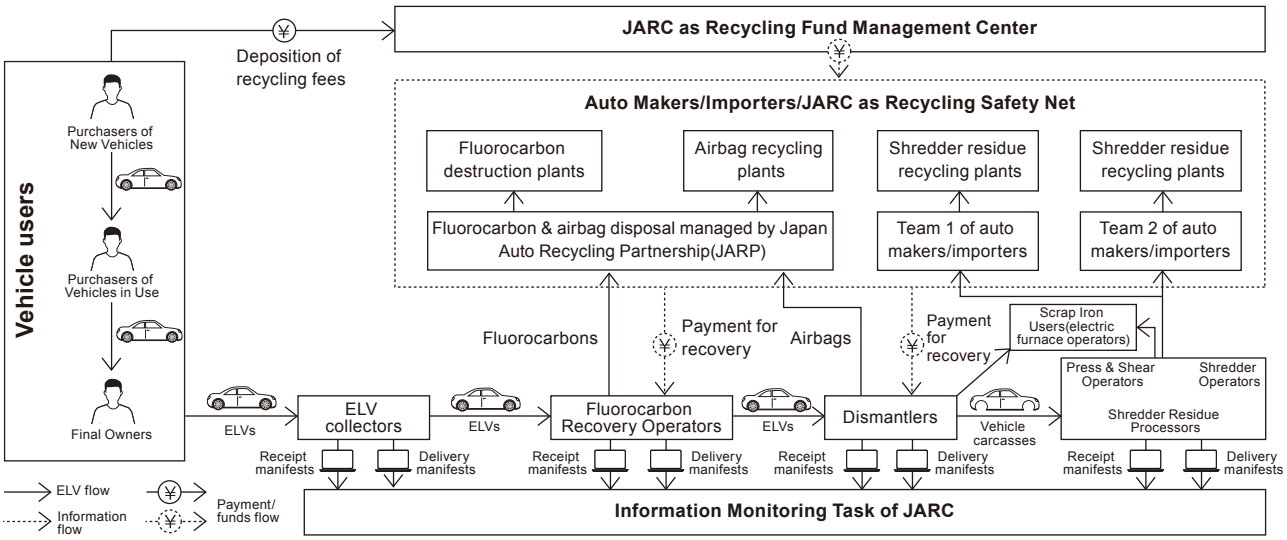
▶ Registration or licensing mandatory for recycling operators

The related business operators that take on a role of recycle and dispose ELVs must be registered or licensed by the local government to conduct recycling business such as dismantling and shredding ELVs. Under each role, ELVs are disposed properly.

▶ Electronic management of ELVs recycling and processing status

The system to electronically manage was introduced ahead of any other system in the world. The system can manage a series of processes for recycling and disposal ASR, airbags, and fluorocarbon from ELVs. Japan Automobile Recycling Promotion Center (JARC) manages proper recycling and disposal and provides information on the status of recycling and processing by related businesses to local governments and others as necessary.

Overall flow of end-of-life vehicle recycling



Q4. Operations financed by recycling fees?

Answer.4

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

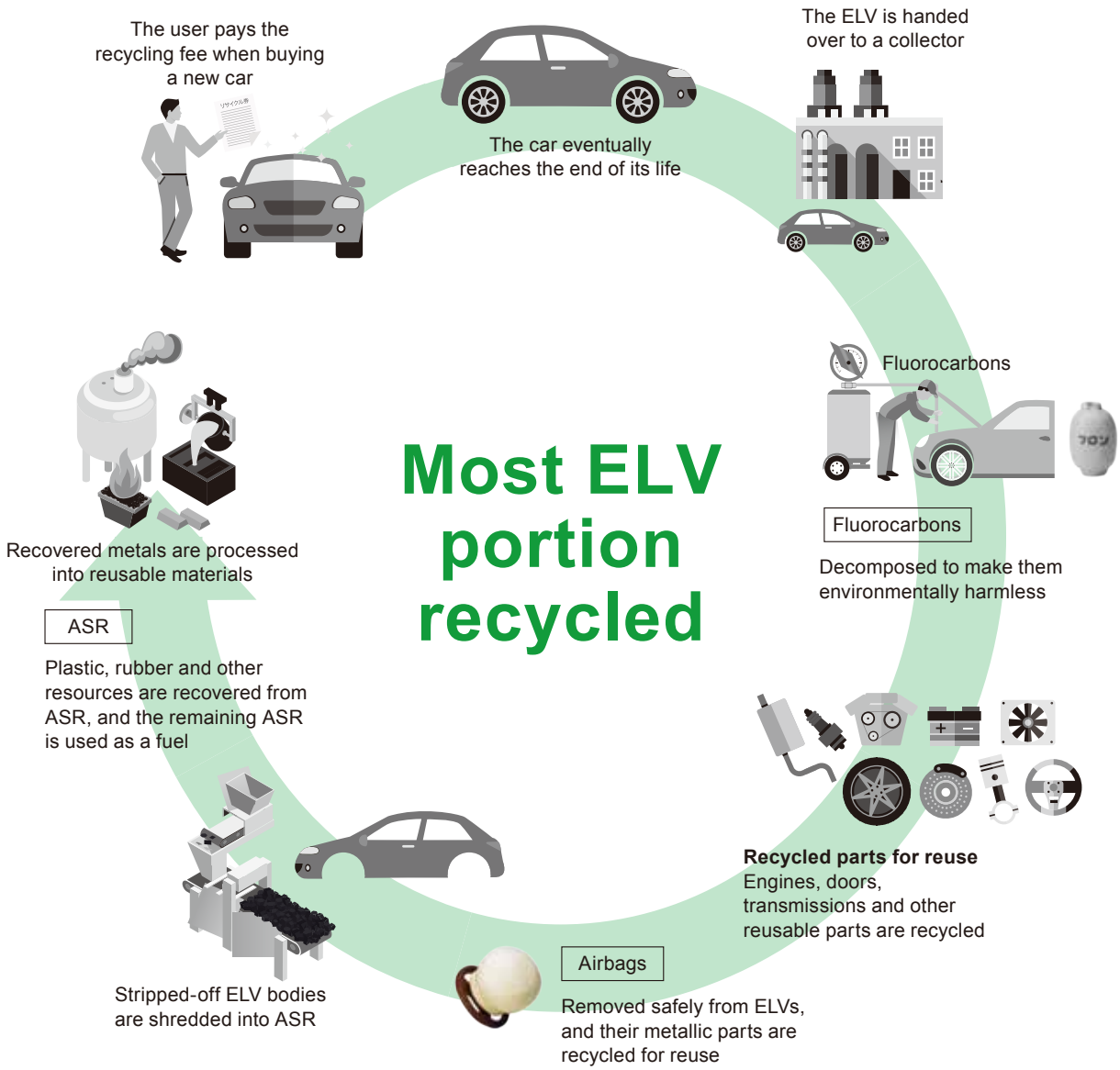
Fluorocarbons are in wide use as refrigerant for car air-conditioning, but must be prevented from escaping into the atmosphere since they are known to cause ozone layer destruction which in turn accelerates global warming. It’s the responsibility of automakers and auto importers to retrieve fluorocarbons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

Q5. Flow of ELVs in the recycling system?

Answer.5

ELVs discharged by users are transferred from Collection operators such as car dealers or a maintenance shops to Fluorocarbons recovery operators. There, refrigerants in air conditioners are recovered. ELVs are then transferred to Dismantling Operators and useful parts and components such as engines and doors are removed from ELVs.
The remaining those scrapped cars are then sent to Shredding and Sorting Operators, where useful resources such as ferrous and nonferrous metals are sorted and recovered. ASR generated during this process is further recycled by manufacturers or importers.

Flow of end-of-life vehicle recycling



Users pay fees for the recycling of 3 items


Fluorocarbons


Airbags

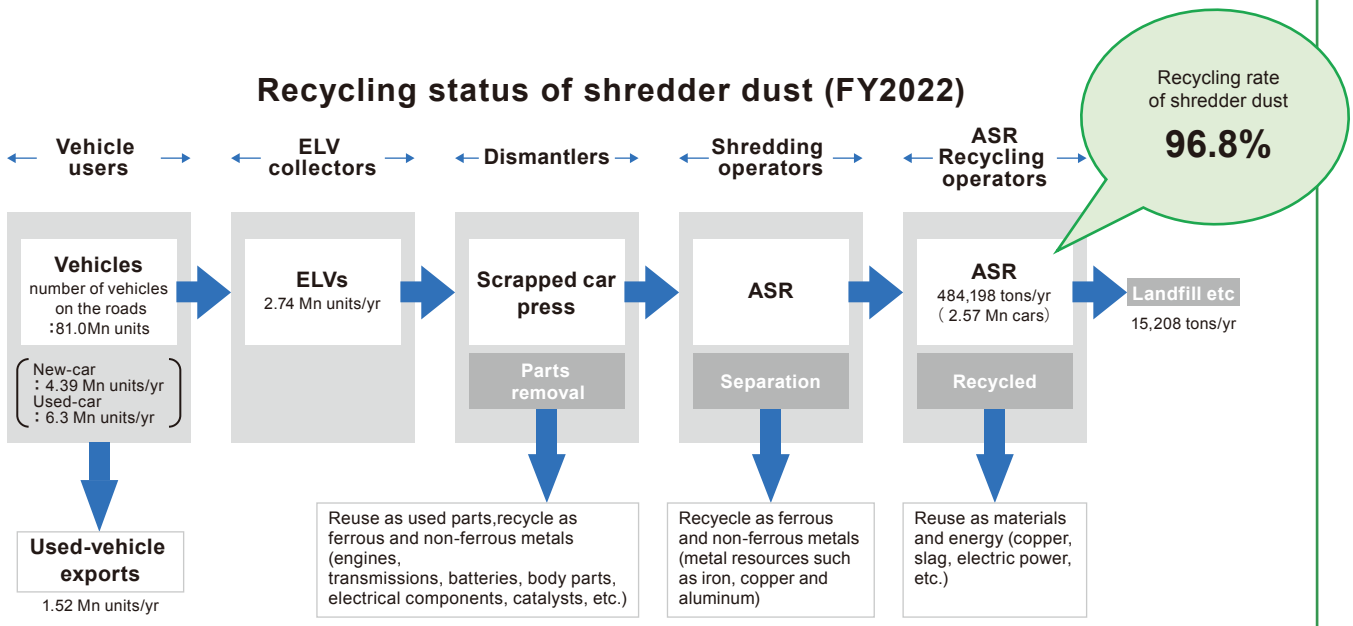

ASR

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 2.74 million units / year) was 484,198 tons (approximately 2.57 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 15,208 tons per year.

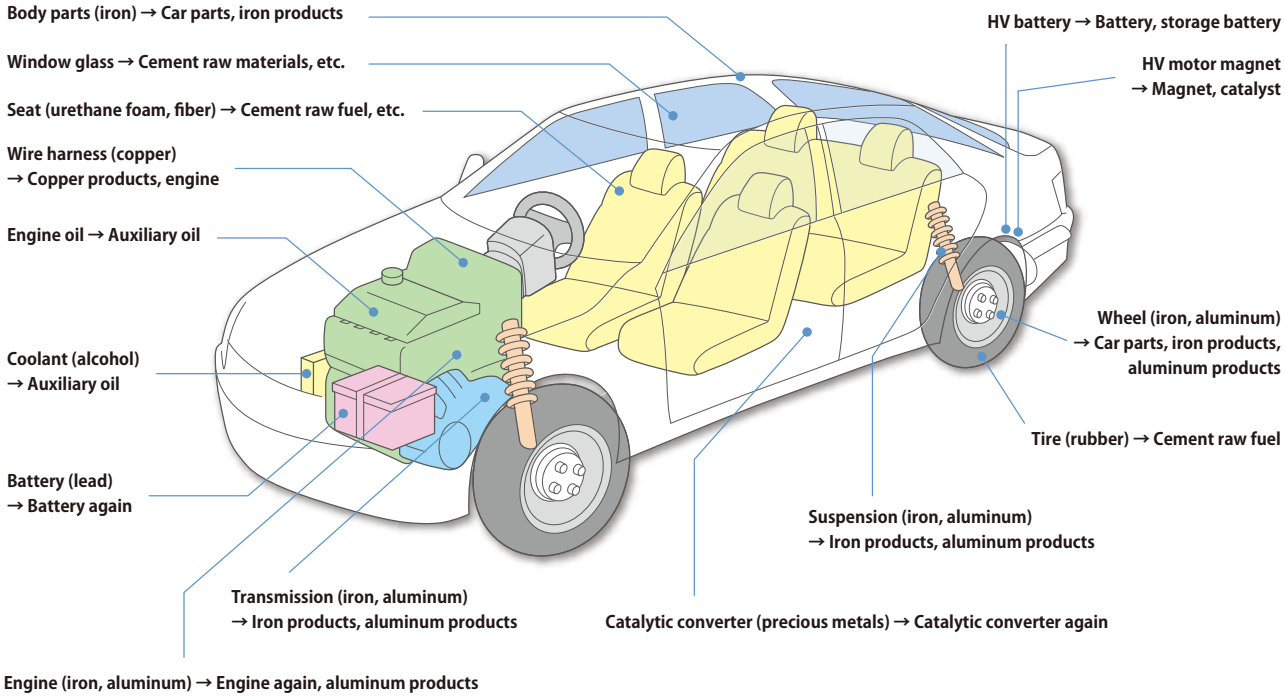
Recycling status of shredder dust (FY2022)



※ ASR is the resin, rubber, glass, etc. that remains after separating and recovering metals from used cars
※ The figures include the ASR equivalent weight that was put into all certified facilities.

Source: Prepared by JARC based on government council documents

Status of ELV recycling



Q7. What are the “recycled parts” ?

Answer.7

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.

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. 2023
Illegally dumped ELVs	22,499 units →	756 units
Improperly piled ELVs	195,860 units →	4,021 units
Total	218,359 units →	4,777 units

Source: Prepared by JARC based on government council documents

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

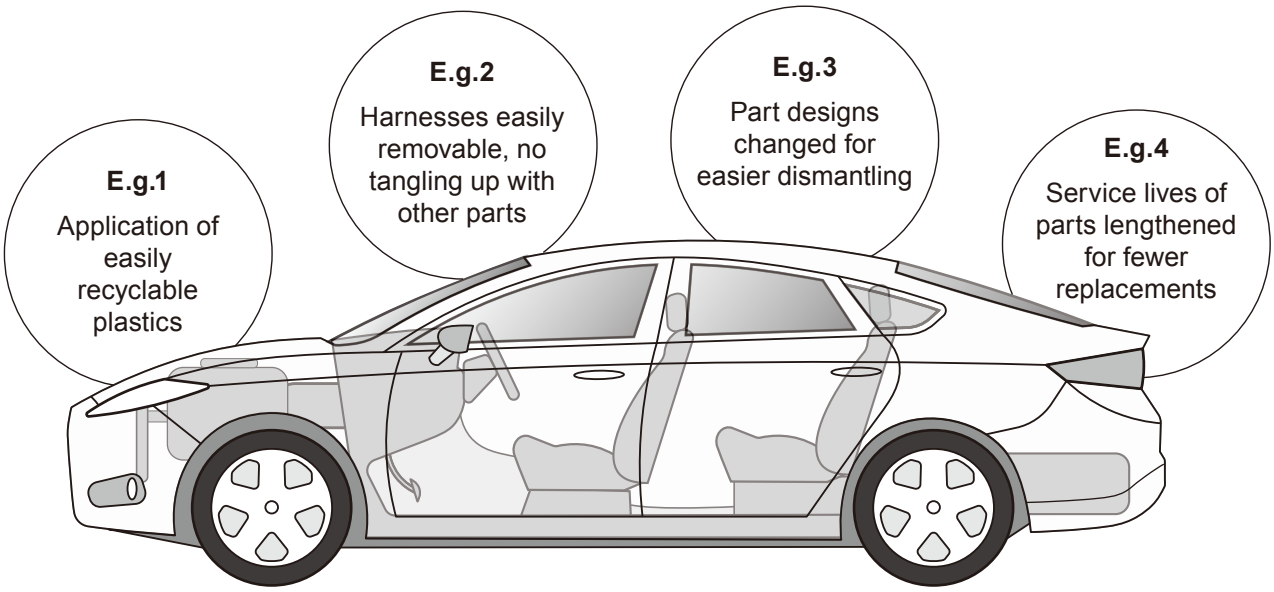
- Dumping site: in Amami, Kagoshima
- Survey period: 7 Jan.~14 Feb. 2008
- Dumped item: ELVs, dismantled bodies
- Dumped amount: 330.0 tons

Q9. Easier-to-recycle designs?

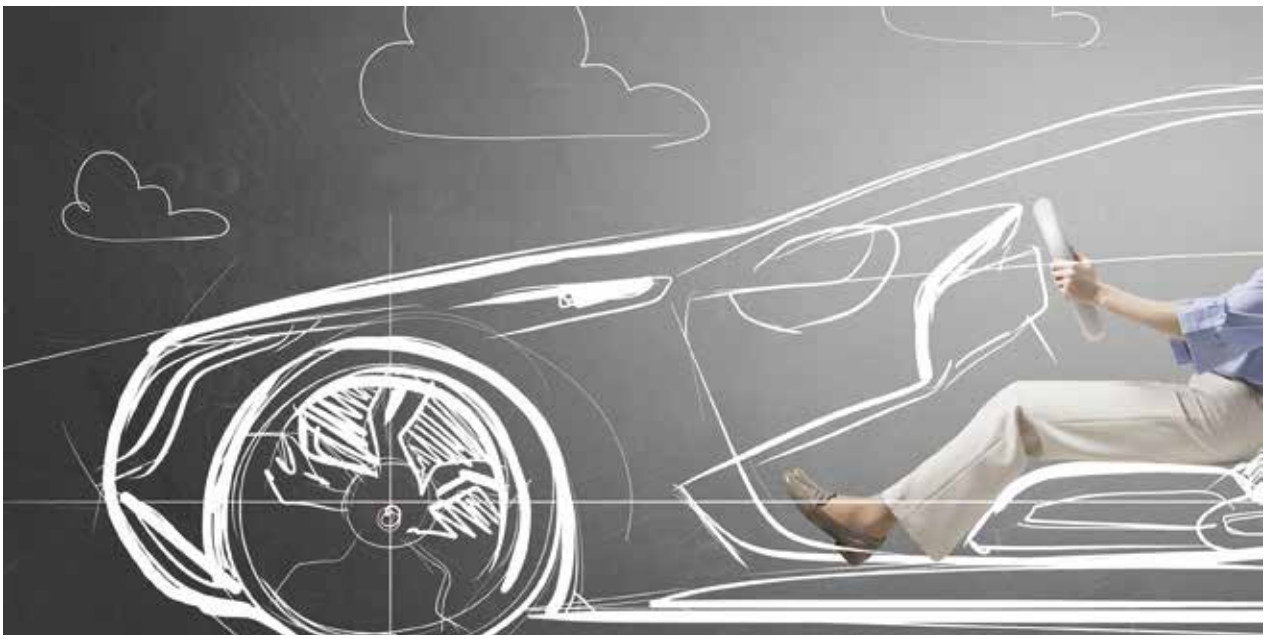
Answer.9

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).

Example of easier-to-recycle designs



Source: Prepared by JARC based on Japan Automobile Manufacturers Association, Inc. documents

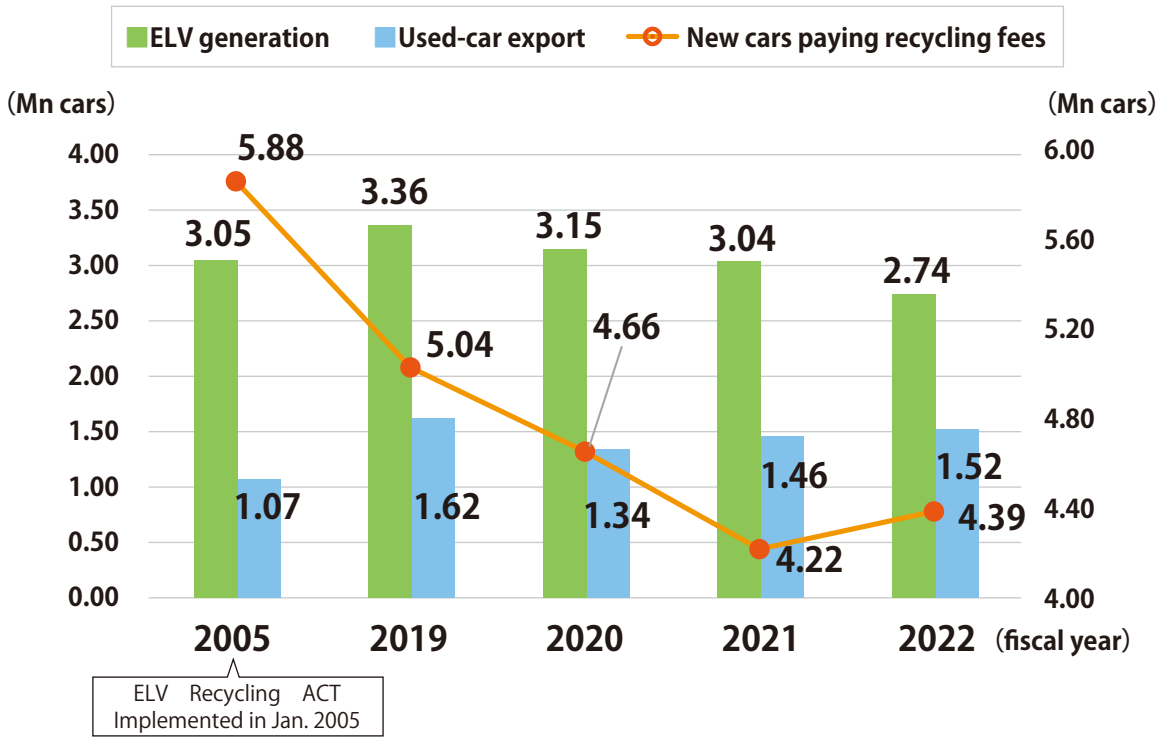


Q10. Vehicle distribution data?

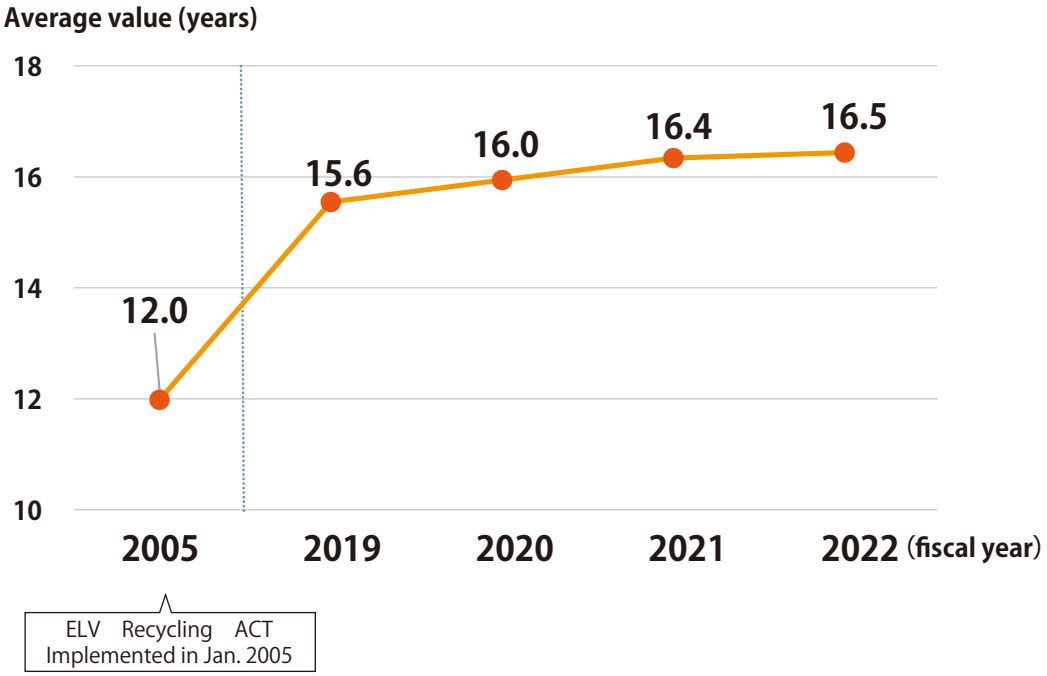
Answer.10

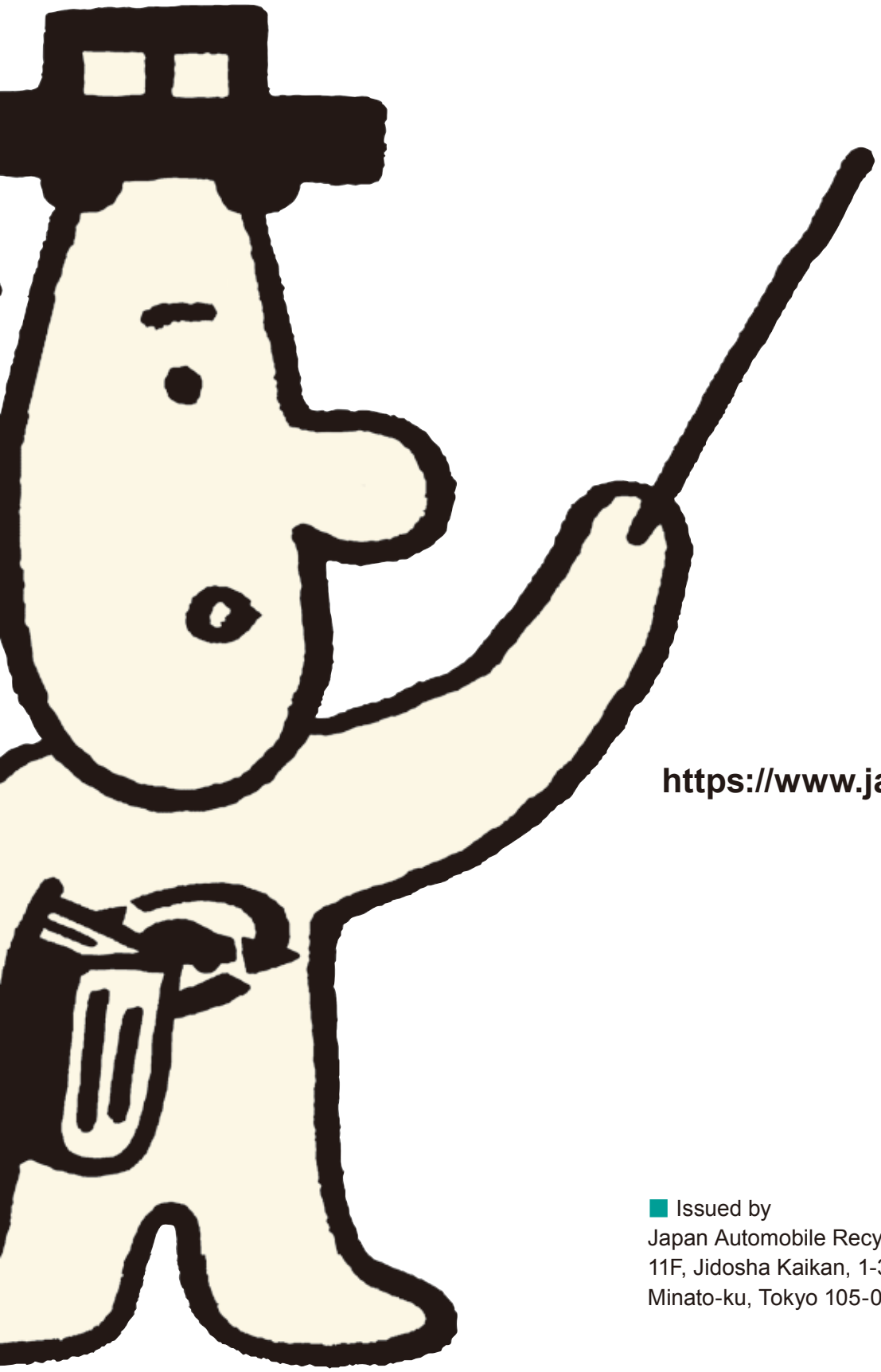
In FY2022, recycling fees for 4.39 million new vehicles were deposited by the vehicle owners, while 2.74 million ELVs were generated and 1.52 million used cars were exported from Japan in that year. The average service life of passenger cars stood at 16.5 years in FY2022 --notably 4.5 years longer than the average service life recorded in FY2005.

＜Vehicle distribution situation data＞



＜End-of life vehicle service life＞





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