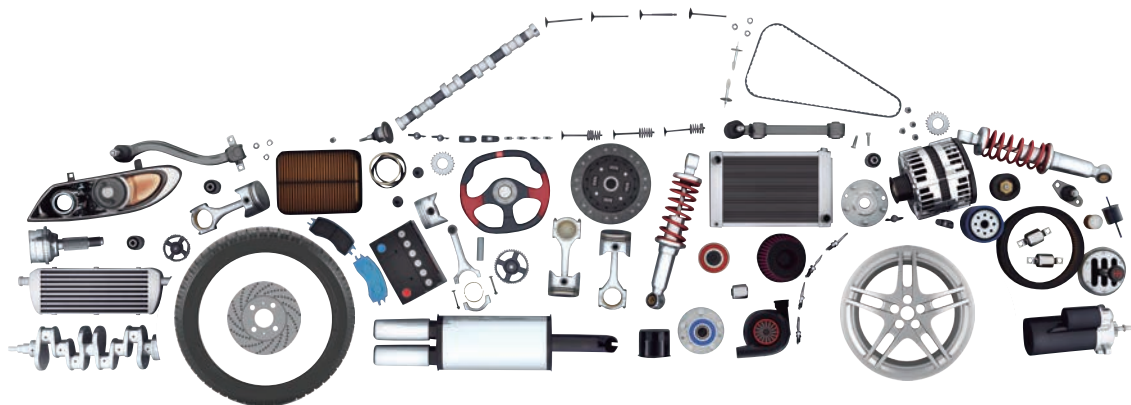


# 10 questions about automobile recycling in Japan



**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). 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’ll answer all the  
questions.”

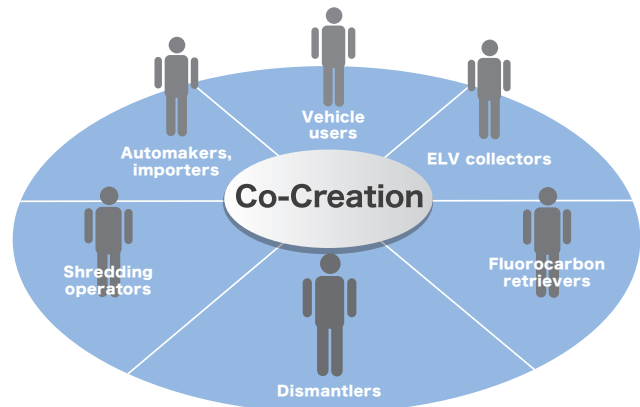


## Q1. Framework of the recycling system?



### Answer.1

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?



### Answer.2

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 became no longer profitable, forcing the dismantlers and shredding operators to stop buying ELVs from the users. Instead, they began to charge fees for their ELV disposal 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.



► **Vehicle users required to pay recycling fees**

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.<br>¥6,000~¥18,000 |
| Airbag fee          |                           |
| Fluorocarbon fee    |                           |
| Info management fee | ¥130                      |
| Fund management fee | ¥290*                     |

\* ¥410 when paid at time of ELV collection

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.

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.

The flowchart illustrates the ELV recycling system in Japan, divided into two main sections: the recycling process and the management of recycling funds.

**Vehicle Users and ELV Flow:**

- Vehicle users** are categorized into **Purchasers of New Vehicles**, **Purchasers of Vehicles in Use**, and **Final Owners**.
- ELV flow** (indicated by solid arrows with car icons) starts from **Final Owners** and moves through **ELV collectors**, **Fluorocarbon Recovery Operators**, and **Dismantlers** to **Scrap Iron Users (electric furnace operators)**, **Press & Shear Operators**, and **Shredder Operators**.
- Information flow** (indicated by dashed arrows) includes **Receipt manifests** and **Delivery manifests** at each stage.

**Recycling Facilities and Processes:**

- Fluorocarbon Recovery Operators** handle **Fluorocarbons** and **Airbags** from ELVs, sending them to **Fluorocarbon destruction plants** and **Airbag recycling plants**.
- Dismantlers** handle **Airbags** and **Vehicle carcasses**, sending them to **Shredder residue recycling plants** and **Team 1 of auto makers/importers**.
- Scrap Iron Users (electric furnace operators)** receive **Vehicle carcasses** from dismantlers.
- Press & Shear Operators** and **Shredder Operators** process **Vehicle carcasses** into **Shredder residue**, which is then sent to **Shredder residue recycling plants**.

**JARC as Recycling Fund Management Center:**

- Deposition of recycling fees** (indicated by a solid arrow with a yen symbol) flows from **Vehicle users** to **JARC**.
- Payment for recovery** (indicated by dashed arrows with a yen symbol) flows from **JARC** to **Fluorocarbon Recovery Operators** and **Dismantlers**.
- Information Monitoring Task of JARC** (indicated by a solid arrow) receives information from **ELV collectors**, **Fluorocarbon Recovery Operators**, **Dismantlers**, and **Shredder Operators**.



## 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.



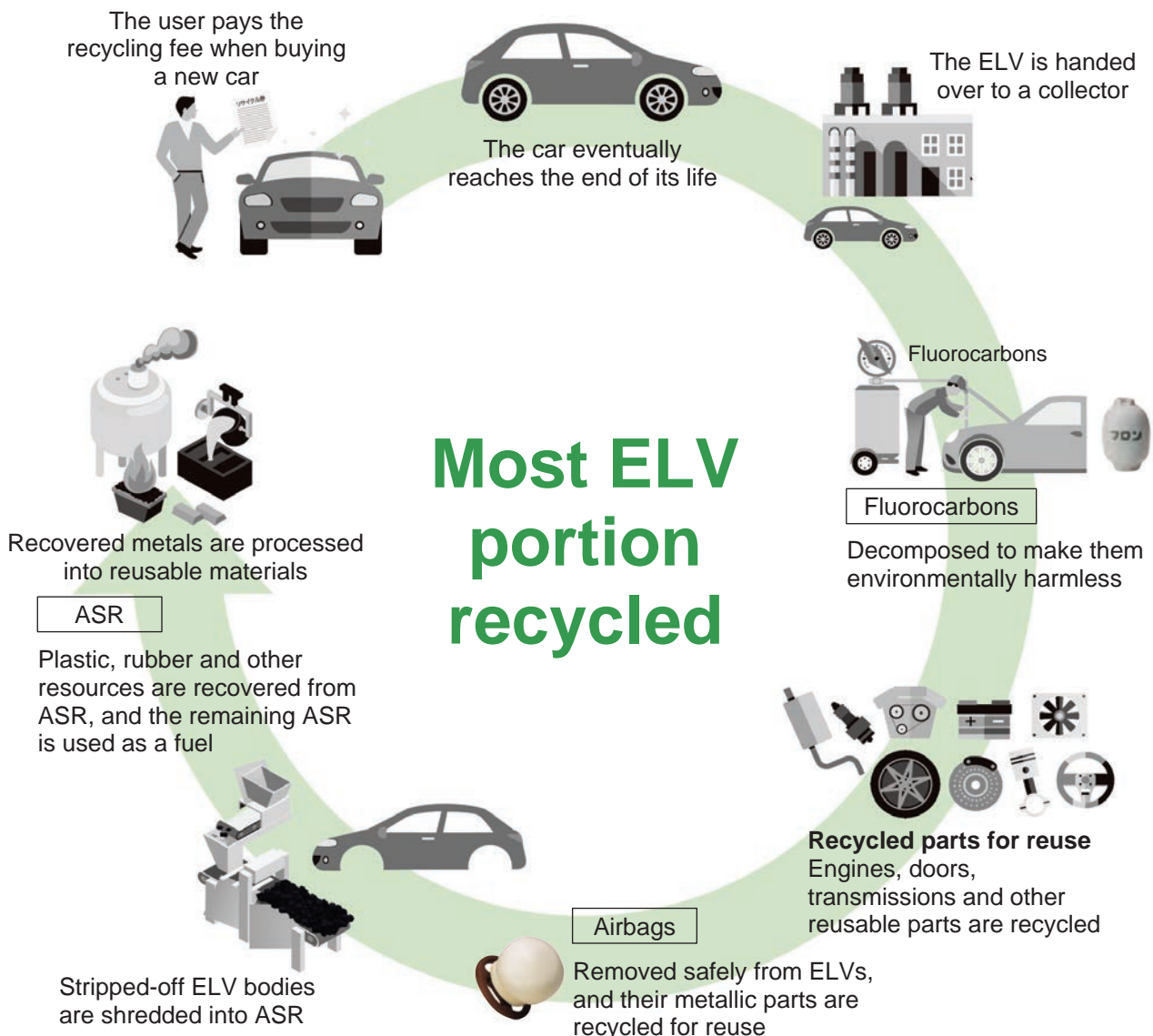
## Q5. Flow of ELVs in the recycling system?



### Answer.5

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.

#### Flow of end-of-life vehicle recycling



|   | Fluorocarbons | Airbags | ASR |
|---|---------------|---------|-----|
| Users pay fees for the recycling of 3 items |               |         |     |

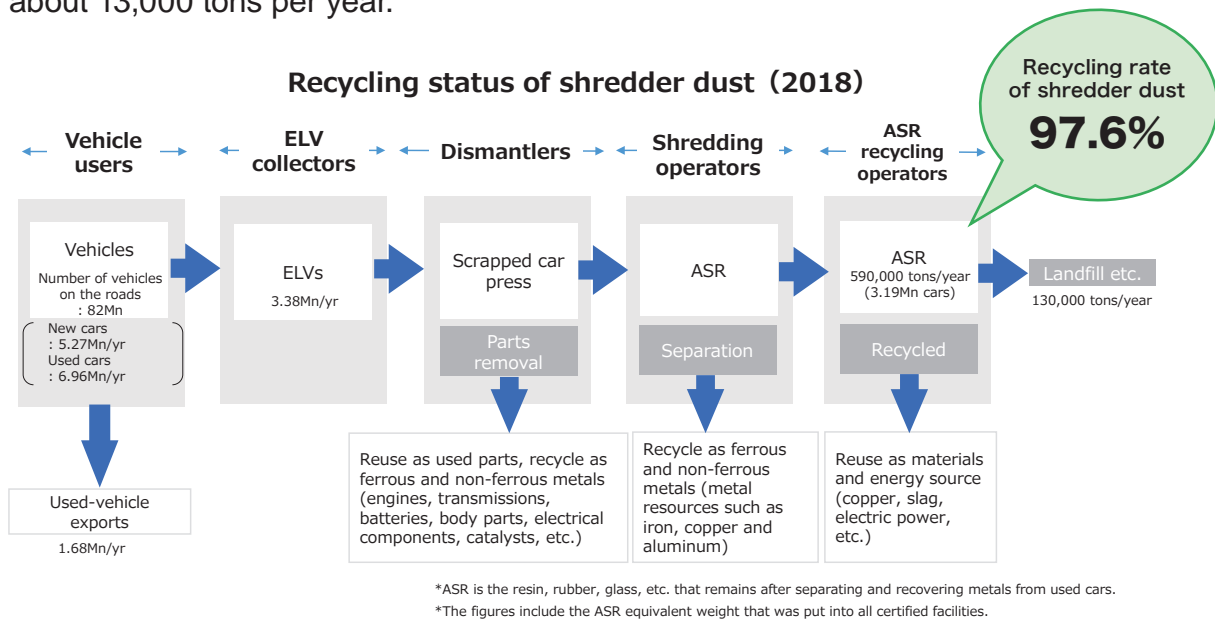
## Q6. Current status of ELV recycling?



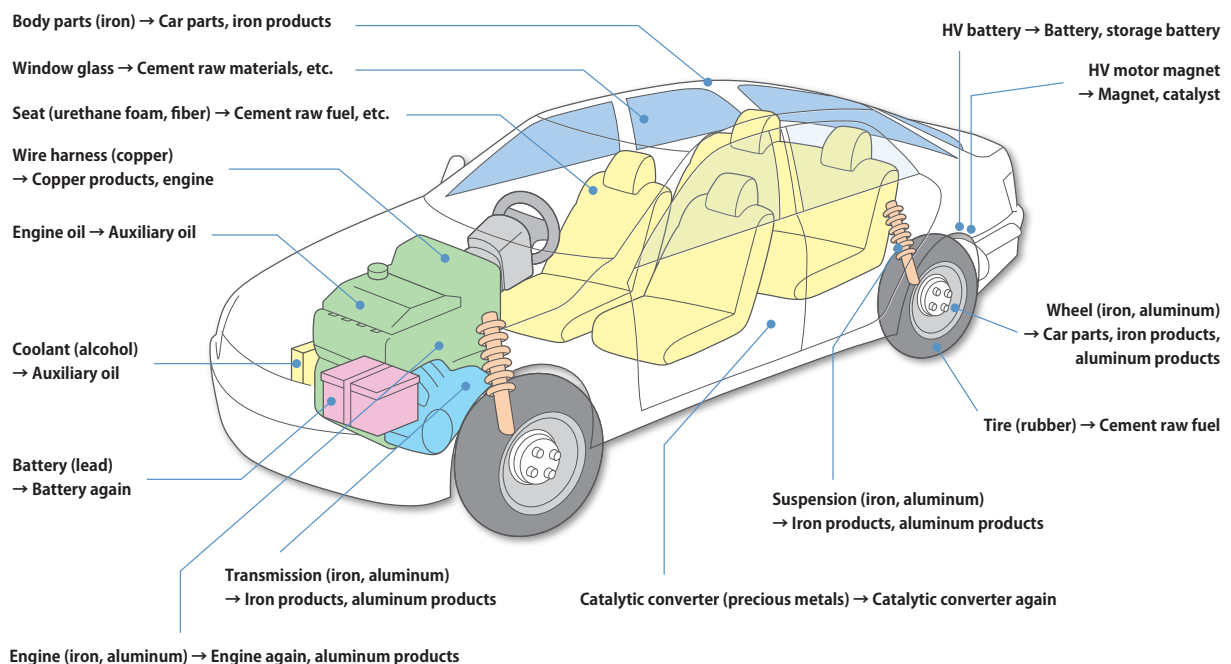
### Answer.6

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 (approx. 3.38 million units/year) was 590,000 tons (equivalent to 3.19 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 about 130,000 tons per year.



### 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:

|                      |  |                   |   |
|----------------------|--|-------------------|---|
| <b>Environmental</b> | Waste emissions and energy consumption are reduced.<br> | <b>Economical</b> | Their prices are lower than the prices of new parts.<br> |
|----------------------|--|-------------------|---|



## 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. 2019 |
|-----------------------|-----------------------------|------------------|
| Illegally dumped ELVs | 22,499 units → 520 units    |                  |
| Improperly piled ELVs | 195,860 units → 4,457 units |                  |
| Total                 | 218,359 units → 4,977 units |                  |

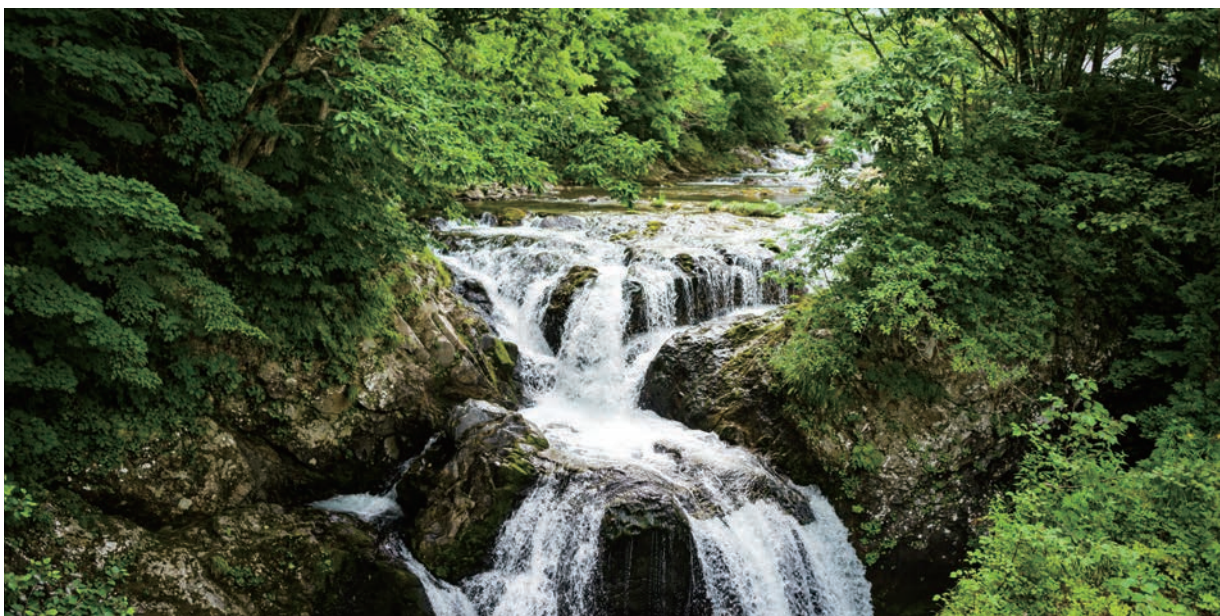
Source: Government council

### 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



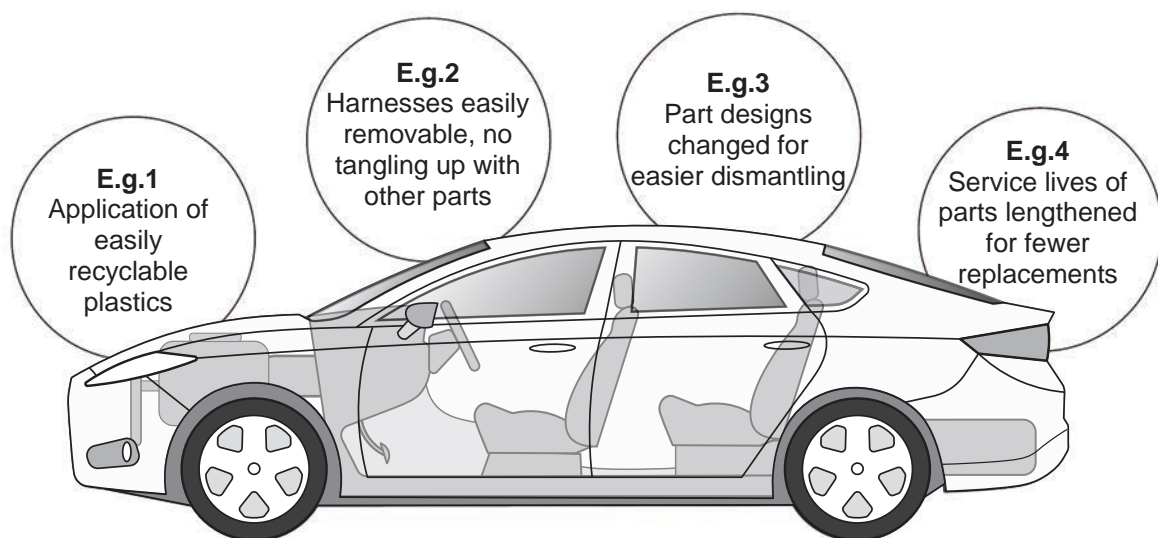
## Q9. Easier-to-recycle designs?



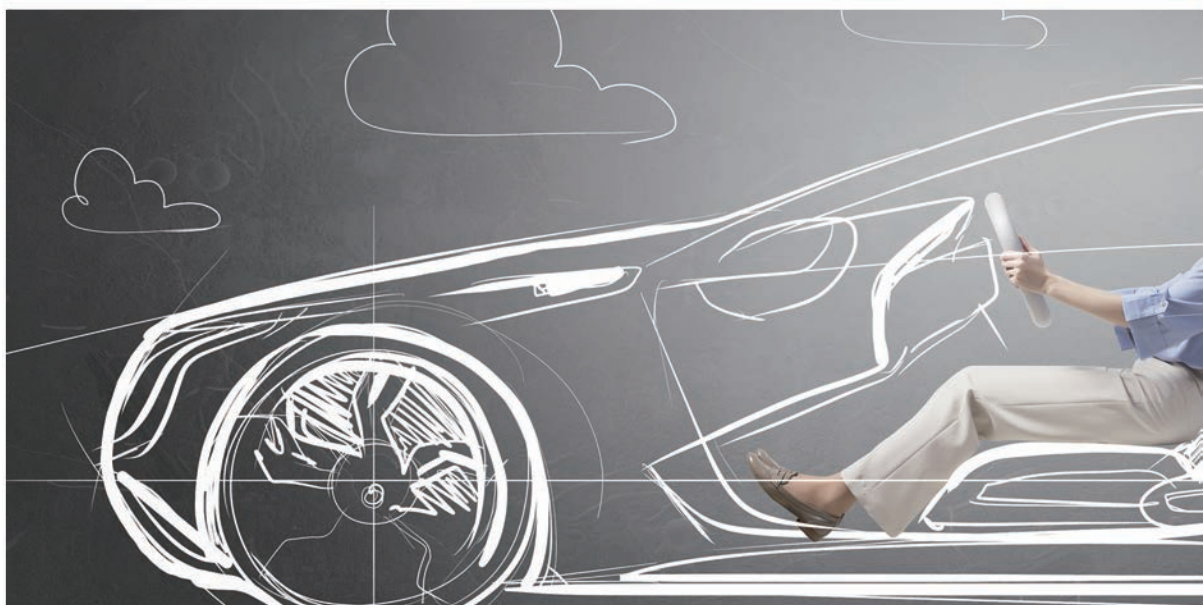
### Answer.9

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: Japan Automobile Manufacturers Association, Inc.



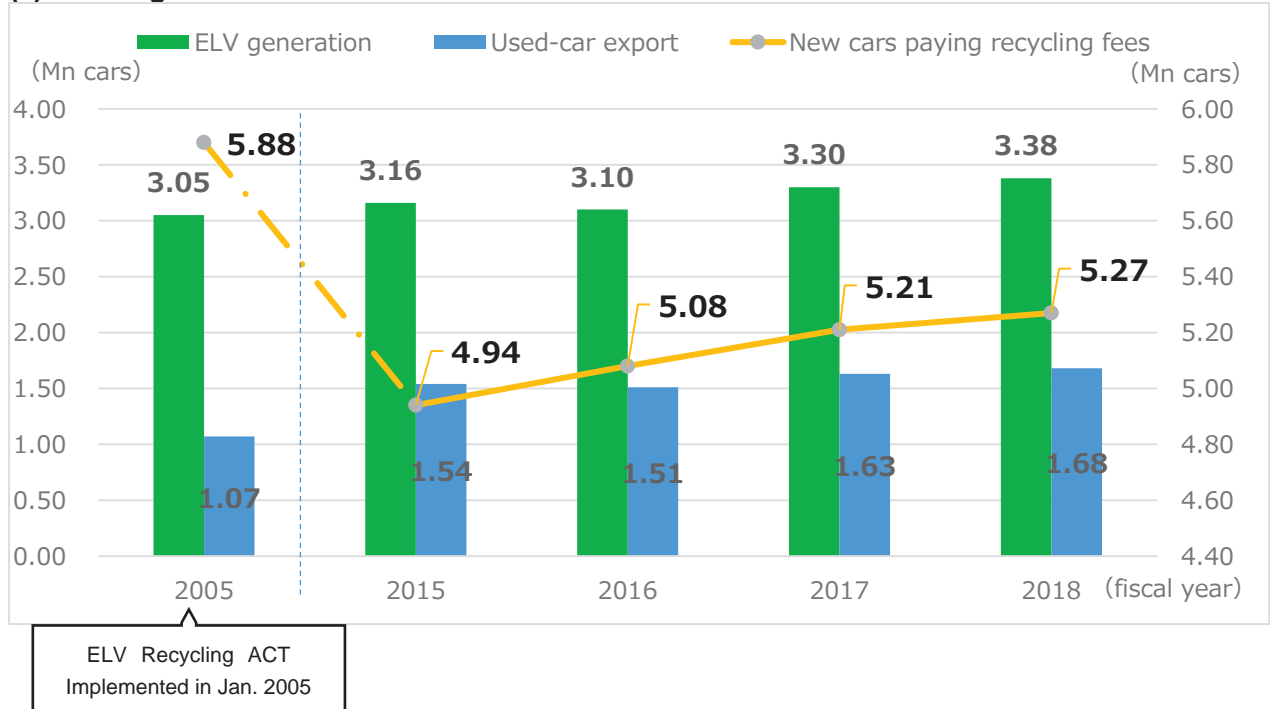
## Q10. Vehicle destination data?



### Answer.10

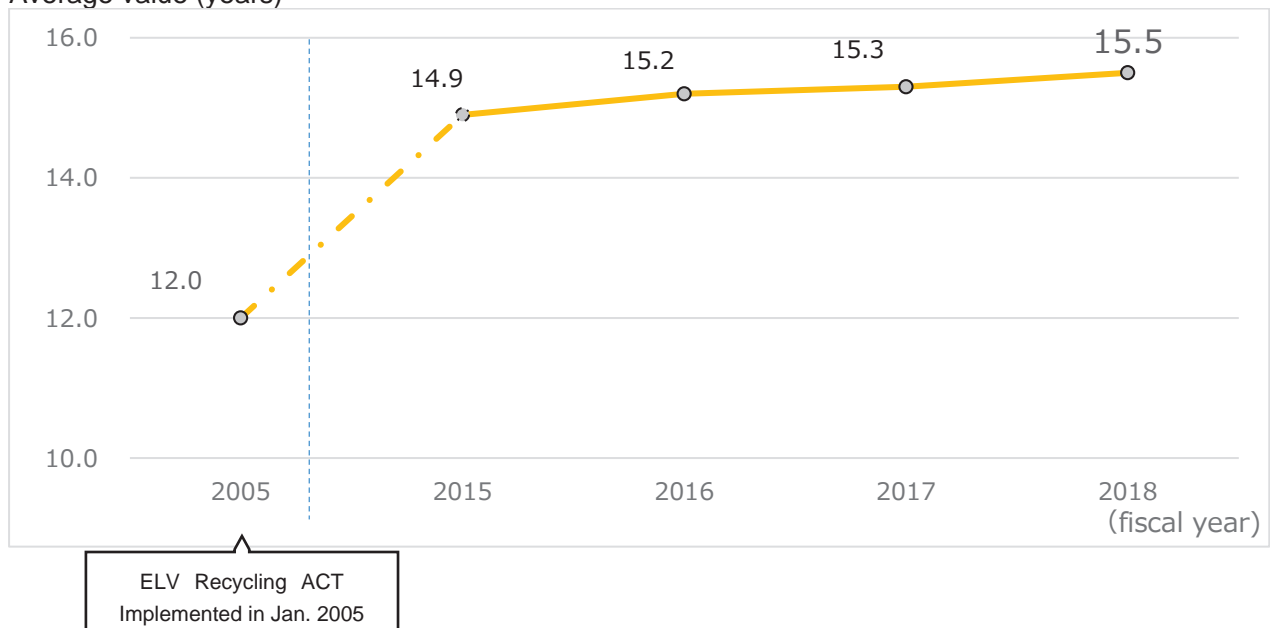
In 2018, recycling fees for 5.27 million new vehicles were deposited by the vehicle owners, while 3.38 million ELVs were generated and 1.68 million used cars were exported from Japan in that year. The average service life of passenger cars stood at 15.5 years in 2018—notably 3.5 years longer than the average service life recorded in 2005.

#### (1) Passenger car destinations

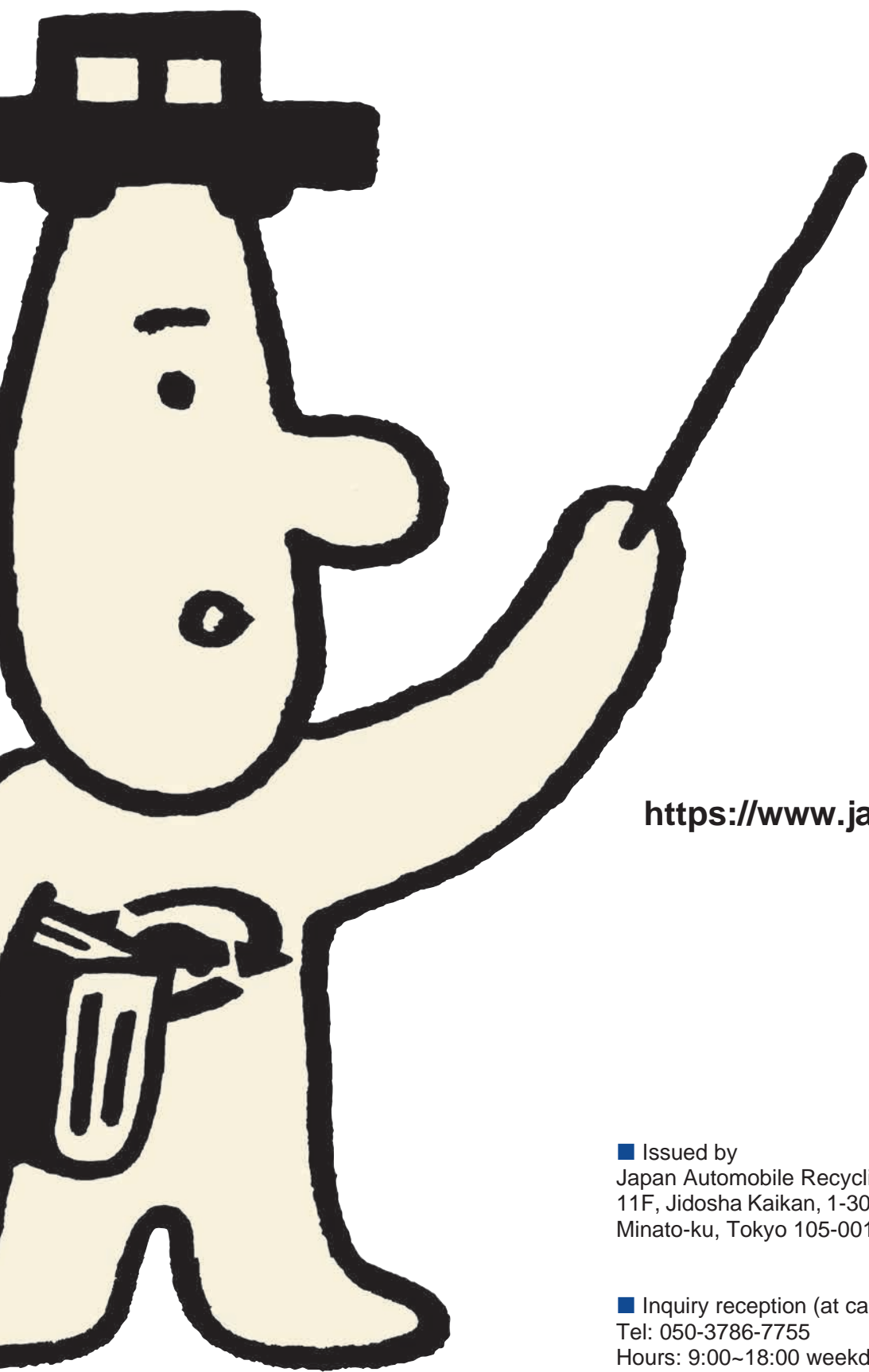


#### (2) End-of-life vehicle service life

Average value (years)







<https://www.jarc.or.jp>



■ Issued by  
Japan Automobile Recycling Promotion Center  
11F, Jidosha Kaikan, 1-30 Shiba Daimon 1-chome,  
Minato-ku, Tokyo 105-0012, Japan

■ Inquiry reception (at call center)  
Tel: 050-3786-7755  
Hours: 9:00~18:00 weekdays  
(no weekends, national holidays)