

Recycling, Respect for Our Cars

10 questions about automobile recycling in Japan



Japan Automobile Recycling Promotion Center (JARC)



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

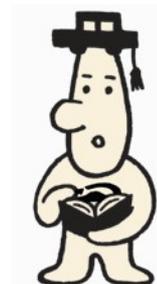
All the passenger cars and commercial vehicles we drive eventually complete their lifespans and go out of service as end-of-life vehicles (ELVs). But because ELVs contain valuable, useful resources like metals and parts, their owners used to sell them to recycling businesses.

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.”

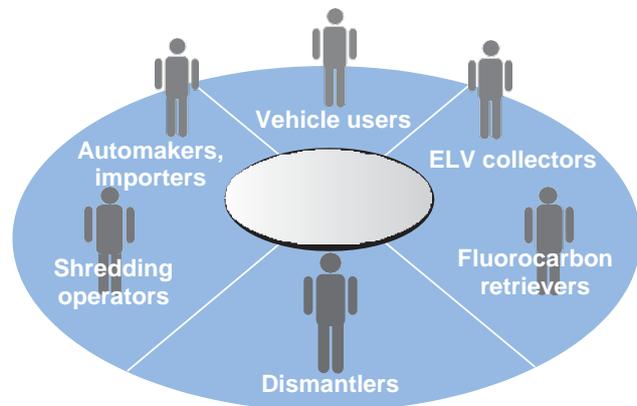


Q1. Framework of the recycling system?



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.



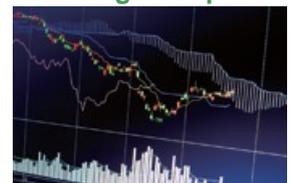
► Growing concerns for the environment and safety

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.



► 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.



Q3. Features of the recycling system?



Answer.3

► **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

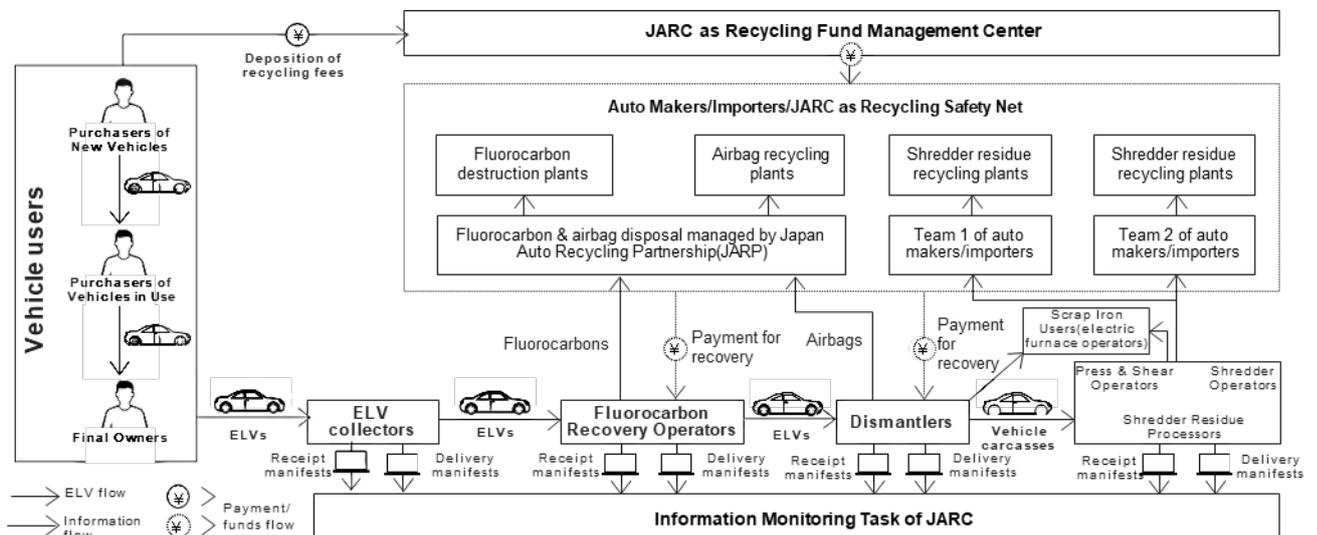
► **Registration or licensing mandatory for recycling operators**

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



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.



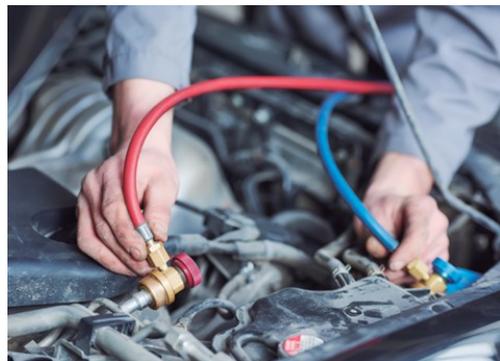
Airbags

“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.



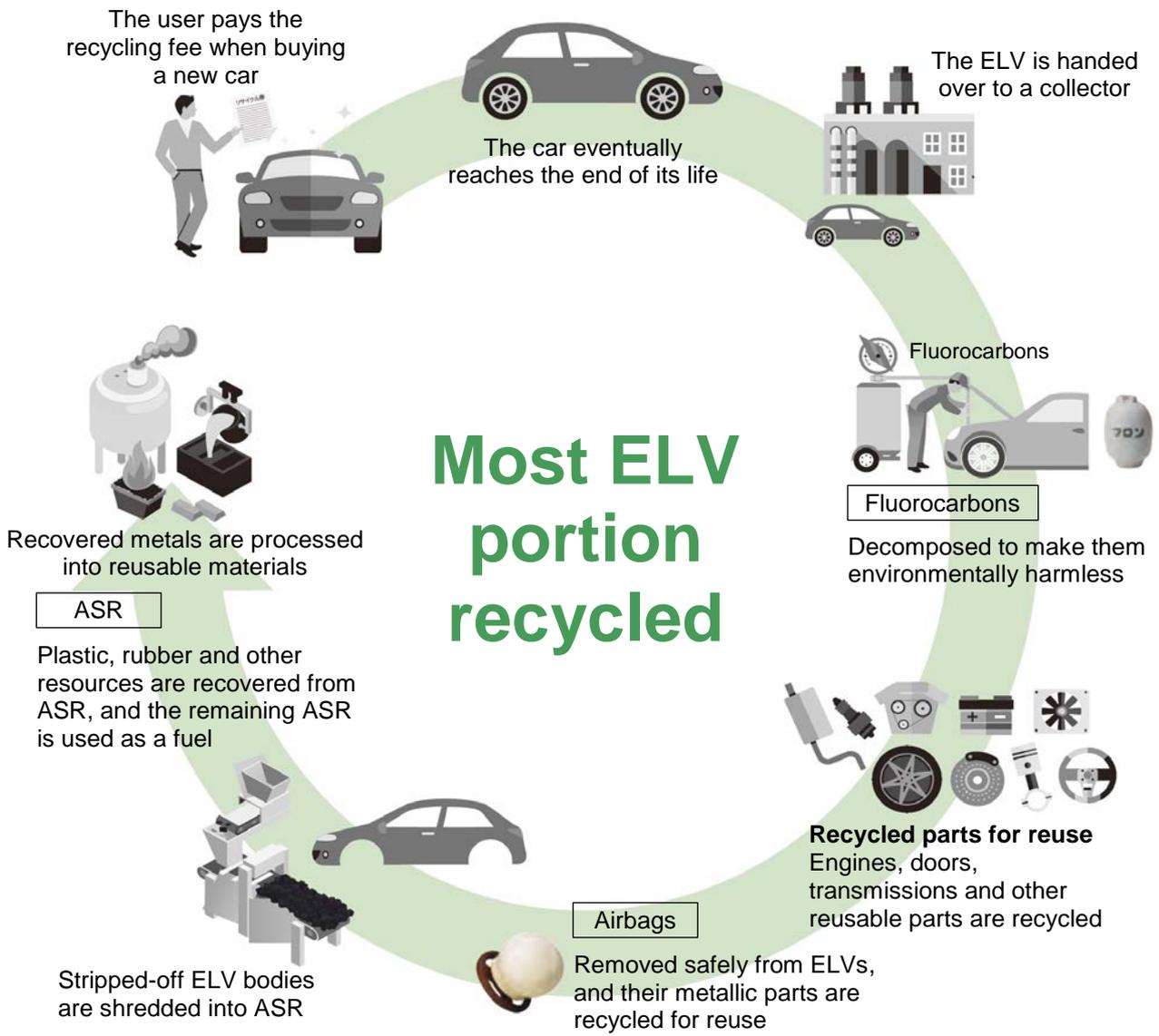
Q5. Flow of ELVs in the recycling system?



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



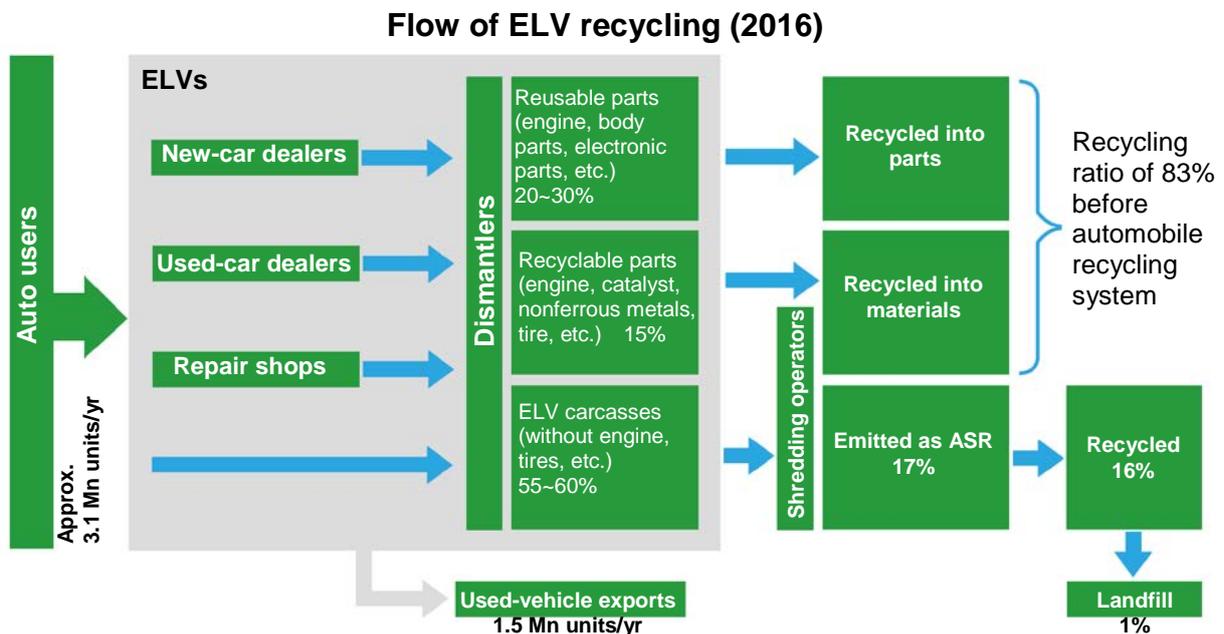
<p>Users pay fees for the recycling of 3 items</p>	<p>Fluorocarbons</p> 	<p>Airbags</p> 	<p>ASR</p> 
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Q6. Current status of ELV recycling?



Answer.6

The end-of-life vehicles emitted by users are handed over to collectors (e.g. auto dealers, repair shops). The collectors deliver them to fluorocarbon retrievers for recovery of the refrigerant. Then, the collectors deliver the ELVs to the dismantlers who remove the airbags safely and recover recyclable parts and materials from the ELVs. The dismantled ELVs are transported from the dismantlers to the shredding operators who recover steel and other recyclable metals and shred the stripped-off ELV bodies into ASR. Finally, the ASR is recycled by automakers and importers. The ratio of recycled parts/materials to total ELV weight is rising year after year.



Source:
Composed by JARC from "The 2018 Environmental Whitepaper" of the Ministry of the Environment

KEYPOINTS

To encourage the proper recycling of ELVs, the Japanese government initially set target recycling ratios for the year 2015--70% for ASR and 85% for airbags. But these target ratios have been far surpassed with the ASR recycling ratio reaching 97.9~98.9% and the airbag recycling ratio recording 94% as of 2017.

Recycling ratio standing

Item	Target	2017 record
ASR	70%	97.9%~98.9%
Airbags	85%	94%

Source: Government council

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. 
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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. 2018
Illegally dumped ELVs	22,499 units	599 units
Improperly piled ELVs	195,860 units	4,600 units
Total	218,359 units	5,199 units

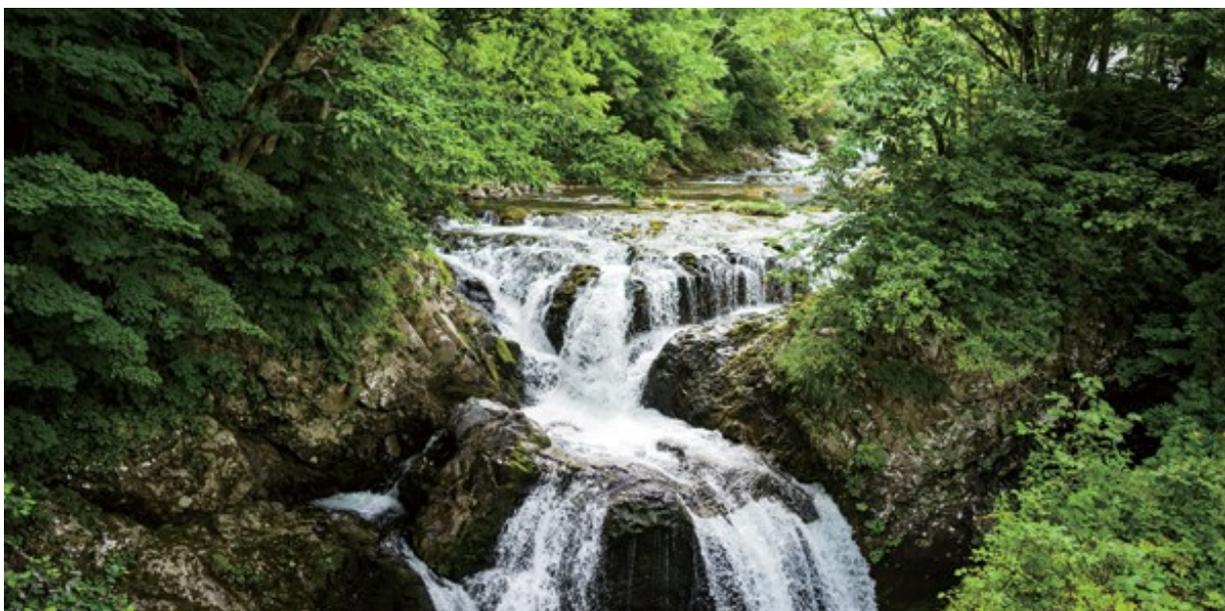
Source: Government council

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



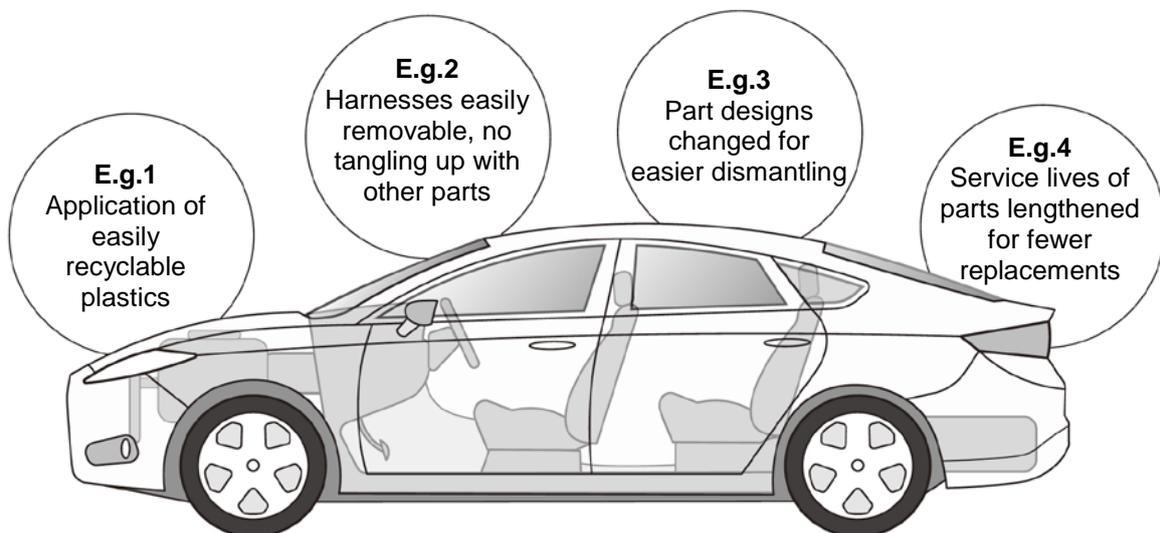
Q9. Easier-to-recycle designs?



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.



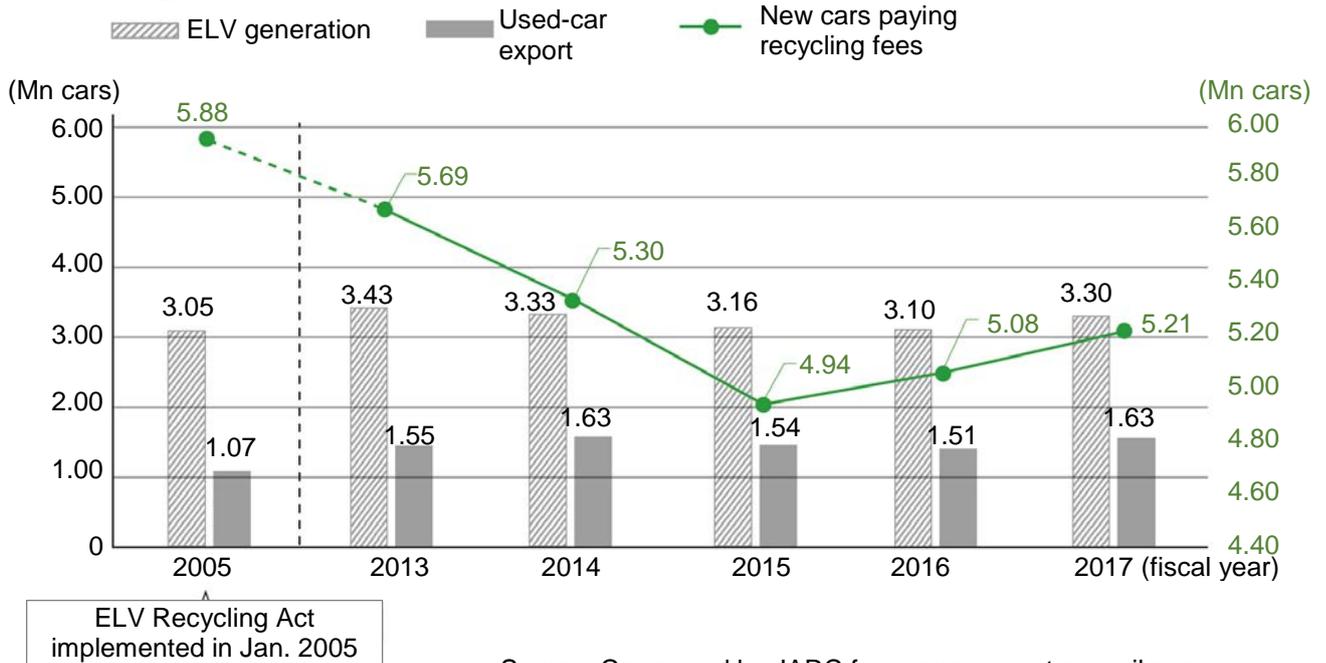
Q10. Vehicle destination data?



Answer.10

In 2017, recycling fees for 5.21 million new vehicles were deposited by the vehicle owners, while 3.30 million ELVs were generated and 1.63 million used cars were exported from Japan in that year. The average service life of passenger cars stood at 15.3 years in 2017- notably 3.3 years longer than the average service life recorded in 2005.

(1) Passenger car destinations

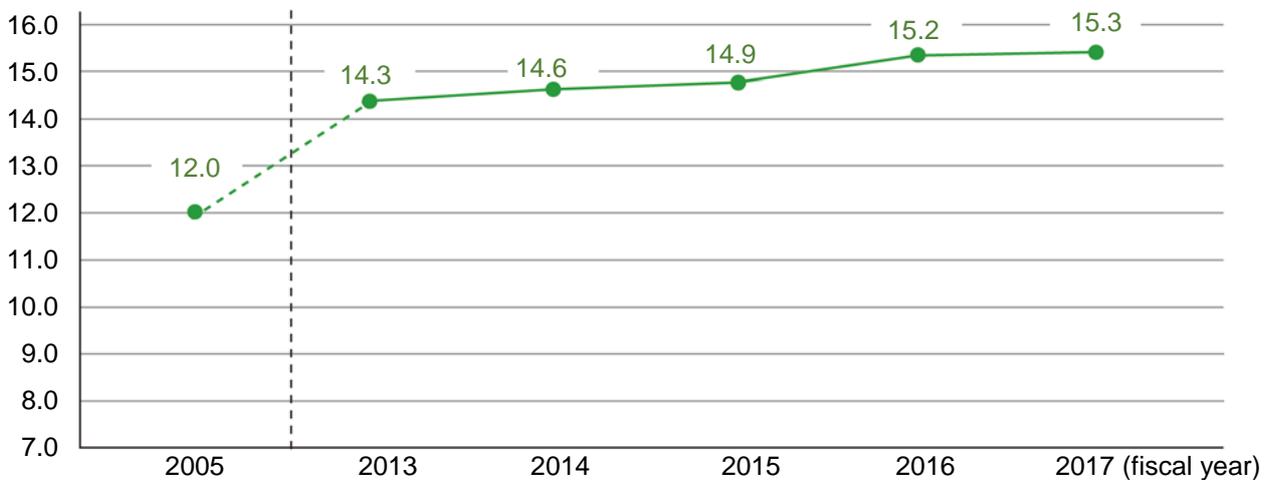


Source: Composed by JARC from government council papers

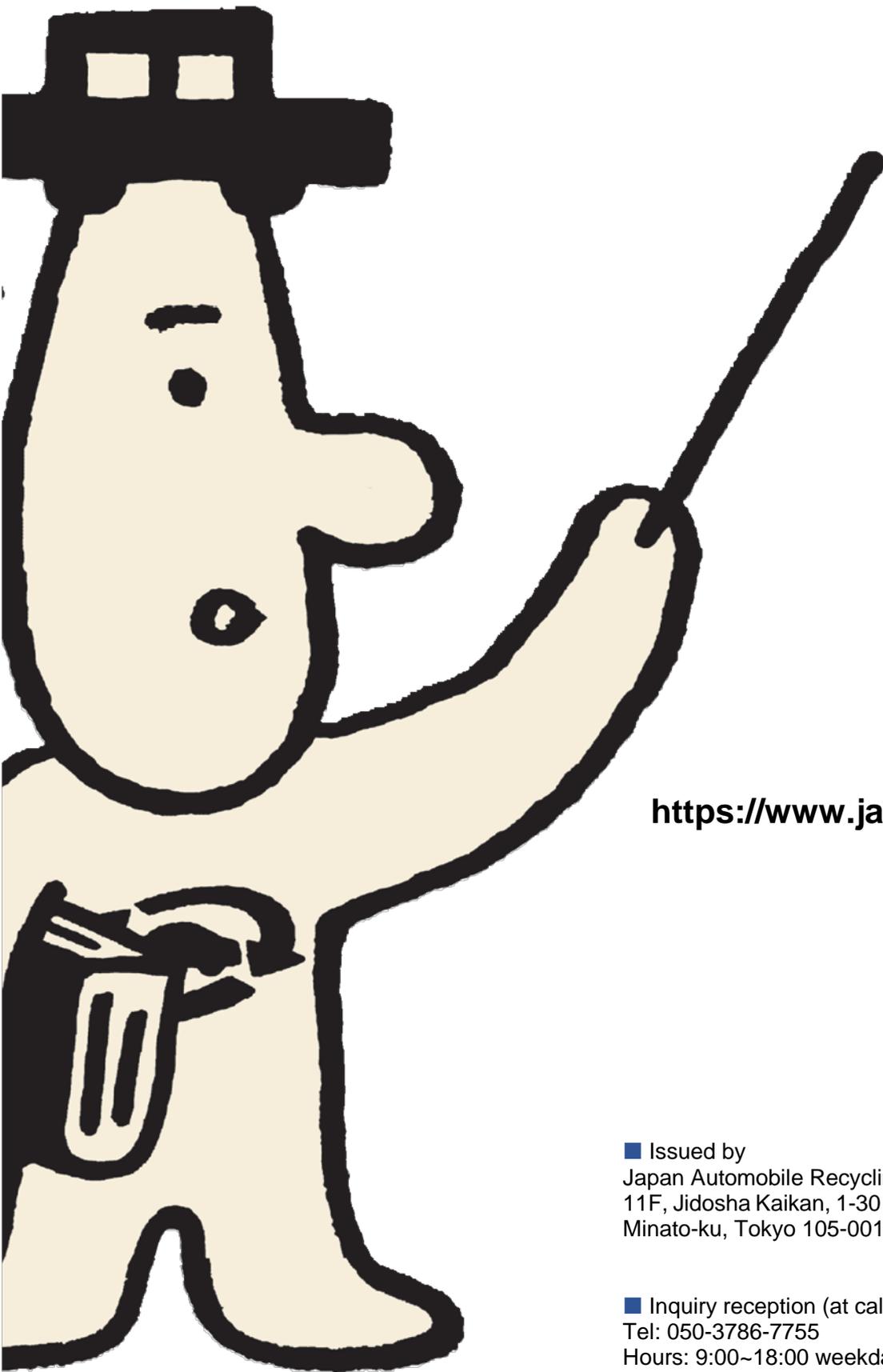
*Export figures based on the records of vehicle deregistration and notification for export purposes

(2) End-of-life vehicle service life

Average value (years)



Source: JARC



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



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