ELVS end of life vehicle solutions

P.O. BOX 3282
Farmington Hills, MI. 48333-3292

March 7, 2017

Arkansas Department of Environmental Quality
Attention: Ms. Becky W. Keogh
Mercury Switch Removal Program
5301 Northshore Drive
North Little Rock, AR 72118-5315

Subject: End of Life Vehicle Solutions Corporation Annual Manufacturers' Implementation Report

Dear Ms. Keogh,

Arkansas's Code Title 8, Chapter 9, Subchapter 8-9-607 (Mercury Switch Removal Act of 2005) requires vehicle manufacturers to annually report on the implementation of a mercury minimization plan including:

- the number of mercury-added switches collected
- a description of the mercury switch capture rate achieved
- the number of end-of-life vehicles containing mercury switches
- the number of end-of-life vehicles processed for recycling
- a description of how mercury switches were managed
- a description of additional actions that may be implemented to improve the mercury minimization plans in the event that the required capture rate is not achieved
- a description of the amounts paid to cover the costs of implementing the mercury minimization plan
- steps being taken by manufacturers to design vehicles and components for recycling

This report is provided by End of Life Vehicle Solutions Corporation on behalf of its member automotive companies. The participating members of ELVS are: FCA US LLC (formerly Chrysler Group LLC); Ford Motor Company; Mack Trucks Inc; Mercedes-Benz USA, LLC; Mitsubishi Motors North America, Inc; Navistar, Inc.; Nissan North America, Inc; PACCAR, Inc; Porsche Cars North America Inc.; Subaru of America, Inc; Toyota Motor Sales USA, Inc.; Volkswagen Group of America, Inc; Volvo Car USA, LLC; and Volvo Trucks North America. This report also includes switches from the former MLC (old GM).

Mercury Switches Collected

For the reporting period of March 1, 2016 through February 28, 2017, a total of 2,454 mercury switches were delivered to the ELVS recycling contractor from Arkansas dismantlers, yielding 5.4 pounds of recovered mercury. Switches were submitted by 22 dismantlers during the period.

Overall, a total of 53,870 mercury switches have been submitted by Arkansas dismantlers, yielding 118.5 pounds of recovered mercury. There are 261 registered dismantlers in Arkansas, 101 of which have submitted switches since the program began.

Mercury Switch Capture Rate

A total of 2,555 switches were recovered in calendar year 2016. The estimated number of switches available for recovery in Arkansas during 2016 was 22,000, resulting in a 2016 capture rate of 11.6%.

Vehicle / Switch Estimates

ELVS uses the National Vehicle Mercury Switch Recovery Program (NVMSRP) Switch Retirement Model (www.elvsolutions.org/model.html) approved by the U.S. EPA and program partners to estimate mercury switch populations. The model was developed to identify switch populations and estimate mercury switch retirement rates through 2017. Therefore, the model focuses on mercury switch counts rather than vehicle counts.

The model estimates that the national total number of mercury switches historically manufactured in vehicles to be 169,185,000. Most of the vehicles containing these switches have already been scrapped, with an estimated 1,859,000 switches remaining in today's national fleet for collection through 2017. Arkansas's portion of these switches remaining for collection through 2017 is estimated to be 19,000.

For reference, the number of mercury switches that were available nationally for recovery in 2016 was estimated to be 2,098,000 units. In Arkansas 22,000 switches were available for recovery in 2016.

For your convenience, regularly updated collection information is available through our contractor's (US Ecology) website, http://www.usecology.com/services/ELVS-Mercury-Switch-Recovery-Program/annual-report.asp?year=all, portions of which are downloadable into Excel. This web-based data tracking system is part of ELVS' commitment to data accessibility, and will be available at least until 2017.

Mercury Switch Management

Mercury switches received by ELVS are generally managed as follows:

- Dismantlers remove the switches, extract and place the mercury pellets in the collection buckets that are provided. ABS assemblies with multiple mercury pellets are returned as units.
- Once the buckets are full, the dismantler contacts US Ecology which pays for the shipping of the buckets to their facility in Michigan.
- US Ecology records the number of mercury pellets and enters them into its database. The pellets are then sent to a retorting facility where the mercury is recycled.

Additional Actions

The goal of ELVS and NVMSRP is to maximize the participation rate, monitor results, and make program improvements as needed to increase the number of switches returned to ELVS.

- In 2016 ELVS participated in a number of regional and national automotive recycling events, some of which were attended by Arkansas recyclers. In 2017, ELVS will continue to attend major events to encourage recycler participation and mercury switch collection.

- Based on a mutual desire to maintain nationwide recovery of automotive mercury switches, auto and steel manufacturers have signed an agreement to continue the ELVS program past the current expiration of the National Vehicle Mercury Switch Recovery Program on December 31, 2017. The ELVS program extension will be from January 1, 2018 through December 31, 2021. The services and program support currently provided by ELVS will continue during the extension of the program.

Program Costs

• Bucket Shipment	$ 699
• Recycling Fees	$ 991
• Bounty	$ 9,520
• State Fees	$ 1,904
• Website/Educational Material	$ 1,200
• Travel/Personnel/Overhead	$ 3,600

Design for Recyclability

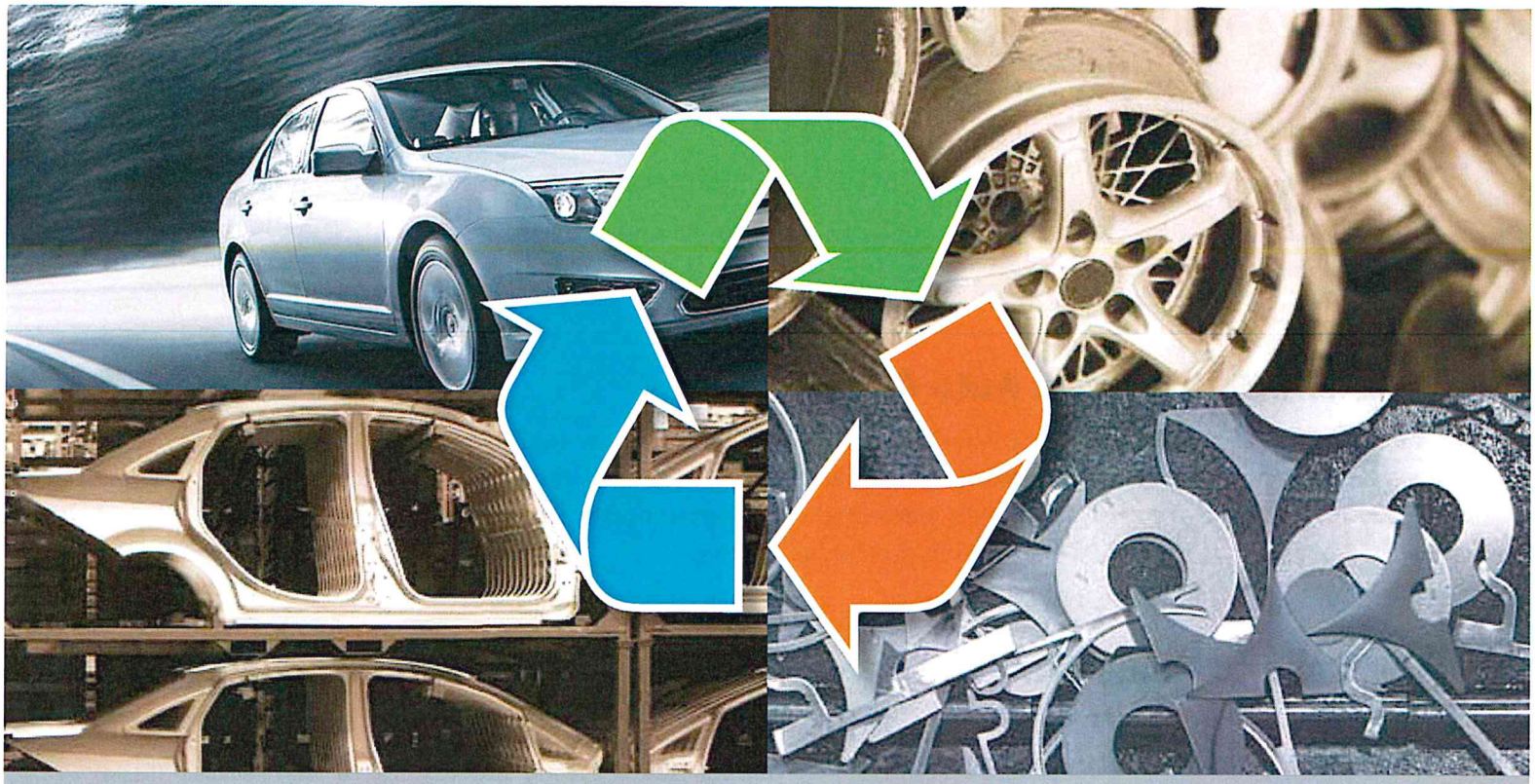
The policies regarding design for recyclability being implemented by automotive manufacturers are described in the attachment, "Automotive Recycling Industry: Environmentally Friendly, Market Driven, and Sustainable" (still current). Additionally, the participating members of ELVS manage restricted substances through the International Material Database System (IMDS). Information concerning this system can be viewed at: http://www.mdsystem.com.

If you have any questions or comments regarding this report, please contact me at brelvs@yahoo.com or 248-477-7357.

Sincerely,

Brian Rippon
End of Life Vehicle Solutions
Project Manager

Attachment:
"Automotive Recycling Industry: Environmentally Friendly, Market Driven, and Sustainable."



Automotive Recycling Industry

Environmentally Friendly, Market Driven, and Sustainable

AUTOMOTIVE RECYCLERS ASSOCIATION
ESTABLISHED 1943

ISRI
Voice of the Recycling Industry
Institute of Scrap Recycling Industries, Inc.

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Today

The United States automotive recycling industry is continuously implementing creative ways to reuse components, reduce waste and increase recycling rates from the process of manufacturing vehicles through their end-of-life recycling.

A Vital U.S. Industry: Auto Recycling

The United States automotive recycling industry—a vital, market-driven industry with more than $32 billion in sales annually—plays a crucial role in the efficient, environmentally responsible recycling of end-of-life vehicles. Automotive recycling businesses employ over 140,000 people at more than 9,000 locations around the country.[1]

The Road to ReinCARnation

The primary goals of the automotive recycling industry are to harvest automobile components for reuse and to recycle the remaining valuable materials into specification-grade commodities that can be used in the manufacture of new basic materials such as steel, aluminum, plastic, copper, and brass.

Auto recyclers remove parts such as engines, transmissions, doors and bumpers for reuse in other vehicles. Other parts that can also be remanufactured include starters, alternators and water pumps. Batteries, catalytic converters, tires and some plastics are removed and their materials are recycled into new products. Fluids such as engine oil, coolant, and gasoline are carefully managed to prevent releases by storing them in double-walled tanks and/or secondary containment prior to being reused or recycled.

Once dismantled, the vehicle is sent to a shredding facility. These capital intensive plants are complex material separation operations. The shredder pulverizes the vehicle into fist-sized pieces of materials, which are then sent by conveyors to sophisticated separation technologies, including magnetic separation, eddy current, laser and infra-red systems. The metal recovered by these plants becomes raw material feedstock for steel mills, electric arc furnaces, aluminum and other non-ferrous metal smelters to manufacture a variety of products, including new vehicles.

How Recycled Products Become New Products

Through the recycling process, end-of-life vehicles (ELVs) are recycled into new vehicles, old consumer products are recycled into components of new vehicles, and parts of old vehicles are recycled into new consumer products. Typically vehicles in North America are composed of approximately 20% post-consumer recycled material by weight.[2] Everything from old carpet to blue jeans may end up in your new vehicle.

ELVs are recycled into new vehicles. Approximately 86% of a vehicle's material content is recycled, reused or used for energy recovery.[3] For example, used carpet becomes air cleaner assemblies and engine fan modules, and manufacturers build new tires with 10% recycled tire rubber material. Recycled tire rubber is also used in brake pedals or floor mats.

Old consumer products are recycled into components of new vehicles. For instance, milk jugs are recycled into auto trim, carpet and used clothing into sound-deadening material, and spent battery casings become splash shields. Recycled plastic bottles are used to make heating and air conditioning vent covers and engine oil level gauges. Nylon carpet is used in air cleaners and evaporative emissions systems. Additional post-consumer plastics are used in components like underbody shields, battery trays, fan shrouds, air conditioner housings and carpets.

ELVs are recycled into new consumer products. In particular, metals such as steel or copper from ELVs are melted down and reused for new consumer products, building construction, or put back into the production of new vehicles. For example, consumer batteries used in such household items as flashlights or cameras, are often made from recycled automotive metal.

Results

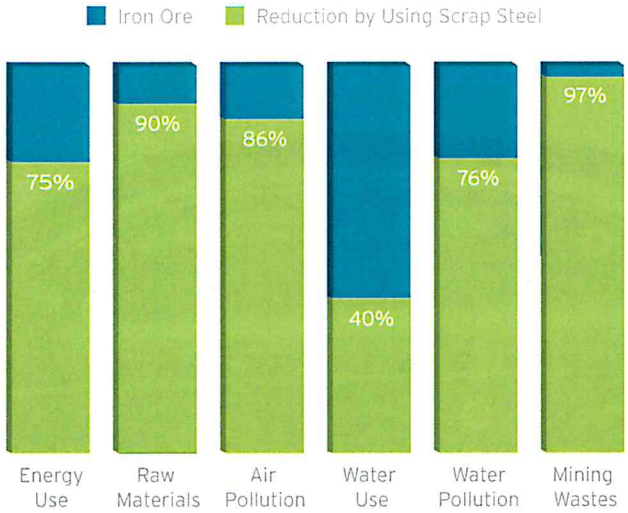
The automotive recycling industry also saves energy, conserves natural resources, reduces air and water pollution and greenhouse gas (GHG) emissions, and recycles environmentally sensitive substances including lead, mercury, oil and unspent fuel.

Using recycled scrap iron and steel reduces the use of virgin iron ore, among other environmental benefits. Every ton of new steel made from scrap steel conserves:[4]

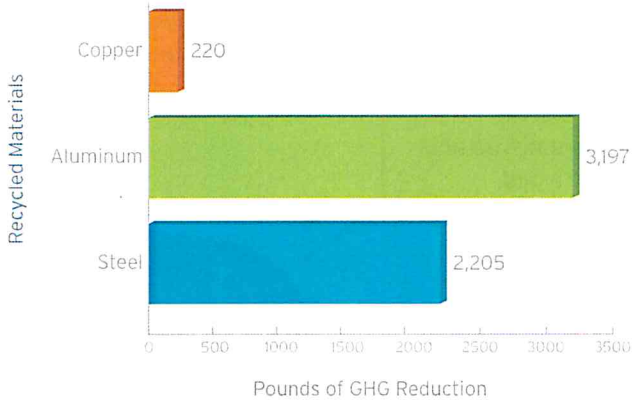
- 2,500 lbs. of iron ore
- 1,400 lbs. of coal
- 120 lbs. of limestone

By using recycled metals, CO_2 emissions are reduced in the manufacturing process. CO_2 is known to contribute to global warming as a GHG by intensifying the amount of heat retained by the atmosphere. Given the approximately 12.6 million vehicles recycled each year by the automotive recycling industry, GHG emissions are reduced by over 30 million metric tons per year.*

Benefits of Using Scrap Steel vs. Iron Ore[5]



Estimated GHG Reductions Per Vehicle Recycled



Estimated by the Fraunhofer Institute for Environmental, Safety and Energy Technology of Oberhausen, Germany.

The Automotive Recyclers Association (ARA) estimates that each year the industry collects and reuses or recycles:

- 100.8 million gallons of gasoline and diesel fuel
- 24 million gallons of motor oil
- 8 million gallons of engine coolant
- 4.5 million gallons of windshield washer fluid
- 96% of all lead acid batteries

Industry is working together to recycle mercury switches from 2002 Model Year and older ELVs. End of Life Vehicle Solutions Corporation, established by the auto industry, works with over 9,000 recyclers in this effort and has collected approximately 4 million switches to date, keeping 9,000 lbs of mercury out of the environment.[6]

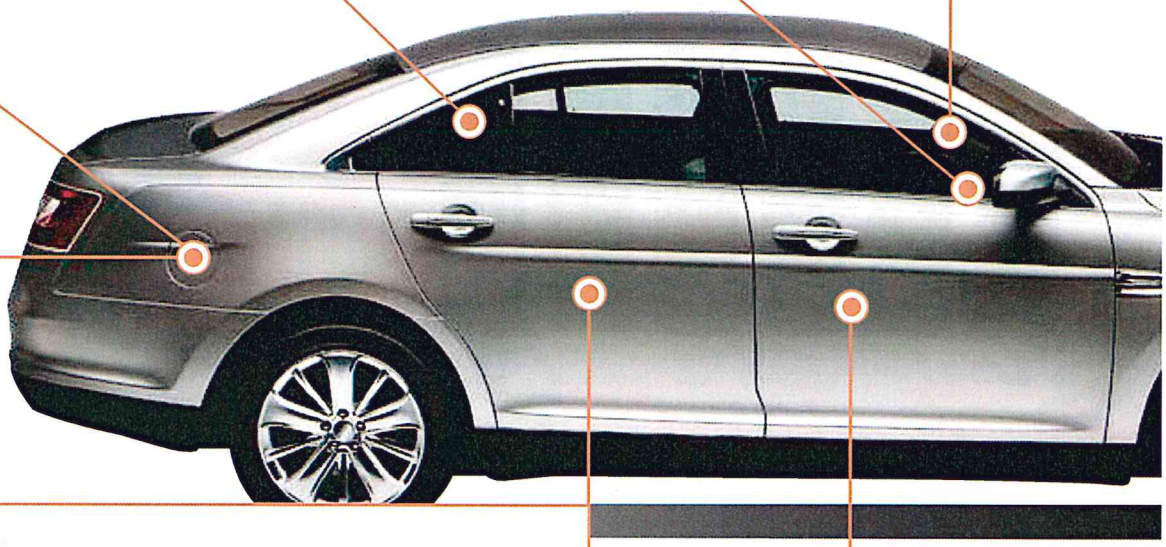
Recycling is a perfect example of a sustainable industry; yielding environmental benefits while using market driven principles to create "green" jobs.

* Average number of vehicles retired per year in the U.S. (from 2001 - 2010, source Wards) is 12,607,000
Average metric tons of GHG reduction per year from recycling vehicles (12,607,000 *.95 * 2.57 = 30,779,991 metric tons per year)

Vehicle Recycling 101

Automobiles are Among the Most Recycled Consumer Products in the U.S.

Automobiles are among the most recycled commodities. Indeed, automobiles maintain a recycling rate of nearly 100 percent![7] Here's what happens to some common components of automobiles during recycling:



STEERING WHEEL
column can be dismantled and resold.

STEREO
can be removed and resold.

SEATS
can be removed and resold.

GAS TANK
can be removed and resold.

GAS
is drained for reuse.

SHEET METAL
can be removed and resold.

SHREDDERS PULVERIZE
the vehicle into fist-sized pieces at the rate of 4 vehicles per minute in the largest machines.

MAGNETS
are used to separate the ferrous (iron and steel) from non-ferrous (aluminum) metals. The recovered ferrous metals are recycled to produce new steel.

SEPARATION TECHNOLOGIES
such as eddy current, laser, infra-red, and flotation separation technologies are used to segregate the mixed non-ferrous metals into pure streams of materials which can then be sent for resmelting.

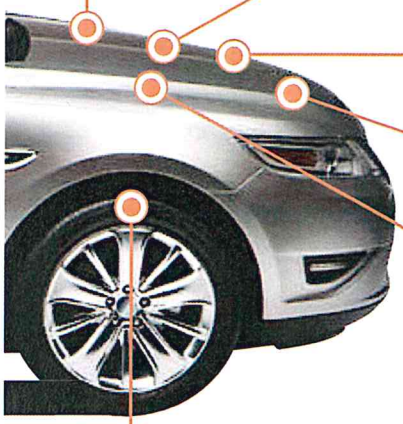
STEEL
is recycled at a rate of more than 18 million tons each year from end-of-life vehicles.[8]

Industry continuously works to optimize vehicle recycling, and searches for solutions that reduce landfill waste.

STARTER & ALTERNATOR
can be removed and resold or sent for remanufacturing.

BATTERY
can be resold or recycled.

WINDSHIELD WASHER
fluid is drained for reuse.

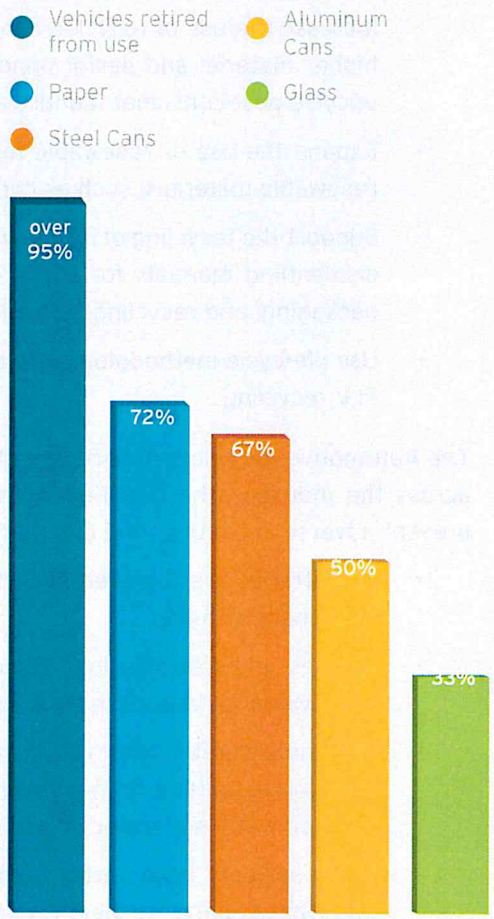


COOLANT
is drained for reuse.

ENGINE & TRANSMISSION
can be dismantled, reconditioned, and resold.

TIRES
are reused depending on a visual inspection and tread depth evaluation. Worn tires can be recycled by shredding, cleaning, and processing into a variety of products including asphalt, playground surfaces and garden mulch. Additionally, worn tires can be used as a fuel for the beneficial recovery of energy.

2010 Recycling Rates[9]



Autos are among the most recycled consumer product. This chart reflects the recycling rate of autos compared with other commonly used products and materials.

Tomorrow

The automotive industry is constantly adapting its business model to support sustainability practices.

A Business Model to Support Sustainability

Automakers are working with industry partners to:

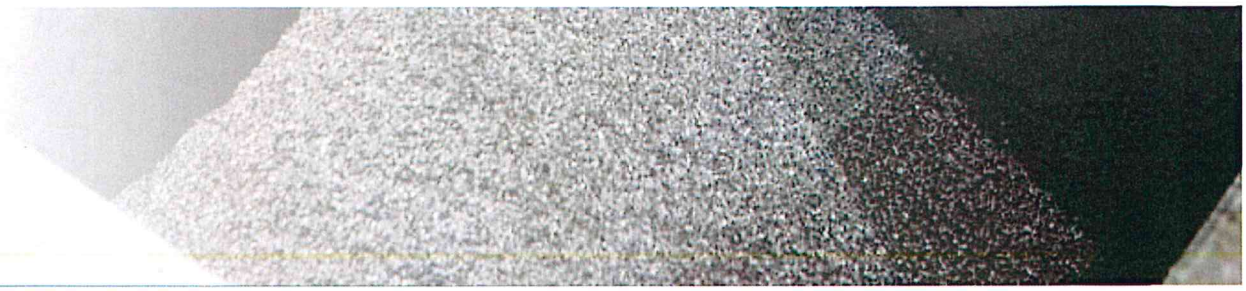
- Eliminate the remaining trace amounts of mercury in automobiles.
- Increase the use of recycled content and work to "upcycle" certain materials - that is, recycle it into uses with higher material and performance requirements than the virgin material. For example, work is being done to upcycle post-consumer laundry and milk bottles into blow-molded automotive components.
- Expand the use of renewable materials presently used and develop new materials and applications for other renewable materials, such as corn-based, compostable and natural-fiber-filled plastics.
- Support the recycling of new technologies such as high voltage batteries. The automotive industry has published dismantling manuals for these batteries[10] and is developing standards for labeling, transportation, testing, packaging, and recycling through Society of Automotive Engineers workgroups.
- Use life-cycle methodologies as guidance to reduce the environmental impacts from raw material extraction to ELV recycling.

The Automotive Recyclers Association (ARA) has established a program which implements best management practices across the industry (the Certified Automotive Recycler program[11]). Automotive recyclers follow these practices to prevent adverse impacts on the environment. For example:

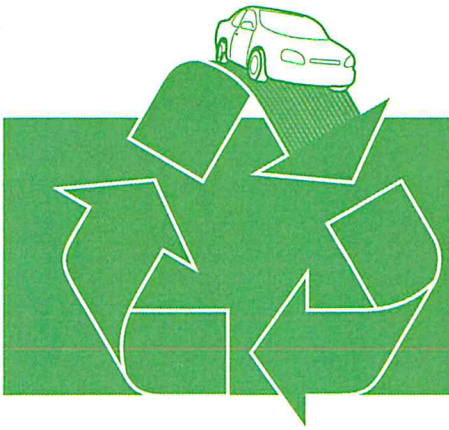
- All batteries are removed and placed either in a covered storage area on an impervious surface or in plastic containers with lids.
- Engines and transmissions removed from vehicles to be resold are stored under a permanent roof on an impervious surface, or in an outdoor covered, weather-proof container.
- Remanufacturable and recyclable engines and transmissions are stored under a permanent roof on an impervious surface, or in an outdoor covered, weather-proof container or on an impervious surface that drains to an oil-water separator or equivalent treatment device.
- Spent solvents from parts cleaning systems are disposed of with an authorized processor. Wash water from water-based parts washers is either recycled or collected for disposal in an approved manner.
- Tires are removed and sent to approved recycling sites regularly, never having more than a semi-load of tires on site at any time.

ARA has long known its responsibility to recycle ELVs in an environmentally sustainable manner. It partnered with the U.S. Environmental Protection Agency in 2000 to establish an online portal that provides state-specific rules and regulations that automotive recyclers must follow to ensure that the ELV recycling process is done in a way that supports environmental sustainability. This portal, which is in its 3rd cooperative contract phase, is named the Environmental Compliance for Automotive Recyclers Center.[12]

ARA also has developed a Green Recycled Parts (GRPs)™ brand that promotes the reuse of original equipment manufacturer (OEM) parts from end-of-life vehicles. By using GRPs, automotive recyclers are reusing quality parts, thus preventing a mountain of waste from ending up in landfills, reducing the need for production of new parts and saving energy and vital resources.



The Institute of Scrap Recycling Industries (ISRI) has developed operating guidelines for shredder plants that are designed to protect the health and safety of everyone at the shredding facility and in the surrounding community and to protect the environment. ISRI also developed the concept of Design for Recycling®, a voluntary standard for manufacturers to follow when designing their products. Design for recycling calls upon manufacturers to reduce their use of hazardous or toxic materials, to design their products so that they are readily recyclable at the end of their useful lives, and to the maximum extent practicable, to increase their use of recycled materials in the manufacture of their products.



From the Past Into the Future

In the mid-1960s, over eight million obsolete automobiles lay waiting to be scrapped, mostly in tow lots , many of which were located near newly built roadways. Auto shredders, developed in the early 1960s, began to proliferate throughout the U.S. helping to rid the countryside of obsolete automobiles. This shredder technology helped recycle ELVs both in the U.S. and in the global arena.

As commodity prices increase and the world economy expands, additional demand for materials is being created. U.S. industry is ready to meet the challenge, delivering innovative, sustainable products while driving technology that will recover more materials from ELVs and protect the environment.

Footnotes

1. Information about the North American Recycling Industry provided by the Automotive Recyclers Association and the Institute of Scrap Recycling Industries.
2. Data provided by Alliance member companies.
3. SAE 2011 Paper "Vehicle Recycling, Reuse, and Recovery: Material Disposition from Current End of Life Vehicles"
4. American Iron and Steel Institute, see www.steel.org/~/media/Files/AISI/Fact%20Sheets/50_Fun_Facts_About_Steel.ashx
5. Norstar Steel Recyclers website at www.norstar.com.au/Recycling/Processing/Benefits.aspx
6. ELVS Mercury Switch Recovery Program Reporting at www.eqonline.com/services/ELVS-Mercury-Switch-Recovery-Program/annual-report.asp?year=all
7. Steel Recycling Institute website at www.recycle-steel.org/en/Steel%20Markets/Automotive.aspx
8. Ibid
9. Data from EPA's 2010 Municipal Solid Waste Reports found at www.epa.gov/osw/nonhaz/municipal/msw99.htm and Steel Recycling Institute (www.recycle-steel.org/en/Steel%20Markets/Automotive.aspx)
10. ELVS website at www.elvsolutions.org/battery_home.html
11. ARA website at www.a-r-a.org and click on the CAR prompt
12. ECAR website at www.ecarcenter.org.

Since 1943, the Automotive Recyclers Association (ARA) is an international trade association which has represented an industry dedicated to the efficient removal and reuse of automotive parts, and the safe disposal of inoperable motor vehicles.

ARA services approximately 1,000 member companies through direct membership and over 2,000 other companies through our affiliated chapters. Suppliers of equipment and services to this industry complete ARA's membership. ARA is the only trade association serving the automotive recycling industry in 12 countries internationally.

ARA aims to further the automotive recycling industry through various services and programs to increase public awareness of the industry's role in conserving the future through automotive recycling and to foster awareness of the industry's value as a high quality, low cost alternative for the automotive consumer. ARA encourages aggressive environmental management programs to assist member facilities in maintaining proper management techniques for fluid and solid waste materials generated from the disposal of motor vehicles.

To learn more about the ARA visit www.a-r-a.org
9113 Church St.
Manassas, VA 20110

Institute of Scrap Recycling Industries, Inc.

ISRI, a Washington, DC, based trade association, represents more than 1,600 for-profit companies - ranging from small, family-owned businesses to large, multi-national corporations -- operating at more than 6,000 facilities in the United States and 30 countries worldwide. Our members are manufacturers and processors, brokers and industrial consumers of scrap commodities, including ferrous and nonferrous metals, paper, electronics, rubber, plastics, glass and textiles. ISRI's associate members include equipment and service providers to the scrap recycling industry. Manufacturers and sellers of equipment and services–such as shredders, balers, cranes, cargo transporters, computer systems and more–find value in promoting the scrap recycling industry through their membership in ISRI.

To learn more about ISRI visit www.isri.org
1615 L Street, NW, Suite 600
Washington, D.C. 20036

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The Alliance of Automobile Manufacturers is an association of 12 vehicle manufacturers including BMW Group, Chrysler Group LLC, Ford Motor Company, General Motors Company, Jaguar Land Rover, Mazda, Mercedes-Benz USA, Mitsubishi Motors, Porsche, Toyota, Volkswagen Group of America and Volvo Cars of North America.

To learn more about automotive recycling, visit www.autoalliance.org
1401 I Street, NW
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