

Policy	Description	Jurisdiction (local, state, national and international)	Lead organisation/s	Participants	Reference
Cooperative Research and Development Agreement to develop sustainable ELV recycling techniques and reduce the amount of shredder residue going into landfills.	<p>A pilot facility that separates shredder residue into four categories:</p> <ul style="list-style-type: none"> • Fines (iron oxides, other oxides, glass and dirt); • Polyurethane foam; • Polymers (polypropylene, polyethylene, ABS, nylon, PVC, polyester, etc) • Ferrous and non-ferrous metals. <p>The facility also has a plastics separation function that recovers the major plastics from shredder residue.</p>	USA		US Department of Energy, Argonne National Laboratory, USCAR's Vehicle Recycling Partnership (includes DaimlerChrysler Corp., Ford Motor Corp., and General Motors Corp.), and the American Plastics Council	Automotive Learning Center (2007)
Design for Recycling					
Easy to Dismantle mark	Toyota has implemented a new "easy to dismantle mark" which is stamped on vehicle parts to indicate points to assist with dismantling – for example, the points where parts can be separated and locations for fuel removal holes.	Japan	Toyota Japan		Toyota Japan (2007)

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Design for recycling	<p>Marking of materials to enable separation of parts for recycling. The Yaris hatchback, introduced in 2005, is an example of design for dismantling, as it includes:</p> <ul style="list-style-type: none"> • Marks stamped to indicate where dismantling can best be commenced; • Dismantling marks stamped on front and rear door trim, deck side trim, back door trim and the front bumper • Clip fastenings rather than screw fastening points • A structure requiring no separating or sorting • An alignment mark for the fuel removal device on the bottom of the fuel tank. This ensures all fuel is safely removed during dismantling. 	Australia	Toyota Australia		Toyota (2006)
Design for dismantling	<p>An easy-to-dismantle vehicle structure has been implemented in Toyota Japan. The design features used have shortened the time for dismantling by 30% compared to the previous model. These features included:</p> <ul style="list-style-type: none"> • Structures that allow areas to come apart when pulled hard • Clips used instead of screws where possible • Integration of parts • Avoidance of composite materials 	Japan	Toyota Japan		Toyota Japan (2007)



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Industry programs, collaboration and targets					
Automotive Consortium on Recycling and Disposal (ACORD)	A voluntary agreement, signed in 1991, to improve the recovery and recycling of ELVs.	UK		Automotive and materials trade associations	Environmental Resource Management, 2000
Consortium for Automotive Recycling (CARE)	A collaborative project aiming to research and technically prove ELV materials re-use and recycling processes.	UK		Main UK motor manufacturers, importers and vehicle dismantlers.	Environmental Resource Management, 2000
Industry commitment to improve management at end of life	The SMMT included two commitments within their seventh Sustainability Report: <ul style="list-style-type: none"> • Provide facilities for consumer to return vehicles for disposal at end of life. • Design and make cars so that at least 95 per cent of the weight of materials used can be recovered at the end of life. 	UK	SMMT (Society of Motor Manufacturers and Traders Ltd)	20 industry signatories to the report	SMMT (2006)
Bumper bar recycling	Recycling of bumper bars that are removed and replaced with bull bars.	Australia	Toyota Australia	Toyota Australia, Toyota Nunawading, Sims Plastics, Sustainability Victoria	Toyota (2006)



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Targets for resource recovery of ELVs	Target: 95% resource recovery rate for cars at the end-of-life stage in Japan by 2010.	Japan	Nissan		Nissan (2007)
A corporation set up to manage programs to recycle mercury switches on a nationwide basis	End-of-Life Vehicle Solutions Corporation (ELVS) was set up to manage the collection and disposal/recycling of mercury-containing switches and to promote correct ELV disposal. (Note: there are no mercury switches on Australian vehicles)	USA	Automotive manufacturers	Participating automotive manufacturers and recyclers	Ford USA (2007) ELV Solutions (2007)
An initiative to ensure the correct disposal of end of life vehicles	This American company, 1877-EndOfLifeVehicles, arranges for ELVs to be picked up and handled appropriately, including the de-pollution at an accredited facility and recycling of the vehicle hulk at a shredder facility.	USA	1877-End-Of-Life-Vehicles	Automotive dismantlers can become affiliates of this organisation	1877-ELV (2007)



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Extended producer responsibility – a charge paid by the manufacturer or importer of a vehicle.	Manufacturers and importers of cars in the Netherlands have made a voluntary agreement to pay a fee for each car that is registered for the first time. The charge is collected by Auto Recycling Netherlands (ARN) which uses the fees to cover the cost of dismantling and recycling materials. Vehicle dismantlers can register with ARN and are then able to apply for a rebate for their costs. Dismantlers are required to meet certain standards to register.	Netherlands	Auto Recycling Netherlands (ARN)	Car manufacturers and importers; vehicle dismantling companies (262 currently registered)	Eur-Lex (2007)
An initiative to ensure the correct disposal of end of life vehicles	Autogreen is a group of automotive dismantlers who provide a network of Automotive Treatment Facilities to manage the ELV directive in the UK. Owners of certain vehicle makes are entitled to free vehicle take-back.	UK	Auto dismantlers	Auto dismantlers, vehicle manufacturers	AutoGreen (2007)

10 Factors which may impact ELV recovery in the future

A range of factors which may impact on the levels of ELV disposal and recovery in Victoria into the future are outlined in Figure 10-1.

Figure 10-1: Factors expected to impact recovery in the future

Factor expected to impact	How will it impact on ELV management	Evidence (reference)
Reduction in cost effectiveness of parts reuse due to: <ul style="list-style-type: none"> Newer vehicles Declining cost effectiveness of repair and maintenance of older vehicles 	Less direct reuse of parts	Environment Australia (2002)
Demand for spare parts increased as insurance companies change their purchasing policy	More direct reuse of parts	Stakeholder consultation (auto dismantlers)
Declining cost effectiveness of repair and maintenance of older vehicles	Reduced life expectancy of vehicles, therefore more vehicles reaching end-of-life earlier	Environment Australia (2002) Stakeholder consultation (metal recyclers)
Increased cost of fuel leading to replacement of current vehicles with more fuel efficient models	Decreased life expectancy for less fuel efficient vehicles, more vehicles reaching end of life	Stakeholder consultation (metal recycler)
Implementation of design for reuse/ recycling	Increased reuse of parts through dealer networks; Greater use of recycled or rebuilt components in manufacture of new vehicles; Increased ability to recycle parts directly from dismantling stage of operation	Manufacturers websites Environment Australia (2002)
Greater number of single resin plastic components and coding of plastics using recognised markings	Increased ease and viability of recycling of plastic components at dismantling stage	Environment Australia (2002)
More plastic components	Decline in the recovery of	Environment Australia (2002)

Factor expected to impact	How will it impact on ELV management	Evidence (reference)
	ELVs (by weight)	
Decline in availability of landfill space	Increased costs of disposal to landfill	
Increased cost of landfilling shredder floc	May encourage alternative disposal including waste to energy, cement kiln fuel, pyrolysis	Environment Australia (2002) 8:42 Stakeholder consultation (metal recyclers)
Increased value of scrap metal	Less stockpiling/ storage of ELVs	Stakeholder consultation (metal recyclers)
Reclassification of shredder floc as hazardous material	Increased landfill costs could result in significant impact on the economic viability of recycling operations	Stakeholder consultation (metal recyclers)
Higher amounts of precious metals in ELVs, for example palladium from catalytic converters and NiMH from hybrids	Increased recovery due to economic viability	Stakeholder consultation (metal recyclers)
Improved technology for recovery of material from shredder floc	Increased recovery levels post-shredding	Stakeholder consultation (metal recyclers)
Improved technology for energy production from shredder floc	Incineration of shredder floc for energy production	Stakeholder consultation (metal recyclers)
Increased labour costs and requirements for OHS	Less dismantling for reuse	Stakeholder consultation (automotive dismantlers)
Uptake of accreditation schemes for auto dismantlers	Higher levels of environmental controls in place	Stakeholder consultation (automotive dismantlers)

11 Possible future pathways

The following is a summary of possible future recommendations for consideration and stakeholder discussion:

- Introduce a requirement for last owner to formally de-register the vehicle
- Enhance consumer awareness of options for ELV disposal
- Promote vehicle size reduction and vehicle longevity in community awareness programs for reduced environmental impacts during vehicle use and end-of-life
- Encourage collection points/ cooperation between local councils and metal recyclers – offsetting the cost of retrieving abandoned vehicles
- EPR initiatives – look at models for implementation of EPR initiatives
- Assess advanced disposal fee systems in Japan and Netherlands designed to cover the cost of correctly dismantling/ recycling vehicles
- Encourage promotion or possible requirement for automotive dismantler to actively implement industry Code of Practice-government verification of compliance
- Promote design for recyclability – using the following criteria as a set rather than individually:
 - Use recyclable materials
 - Use recycled content materials
 - Reduce the number of different materials and composites used within an assembly
 - Mark parts for simple material identification
 - Use compatible materials within an assembly
 - Make it easy to disassemble
- Discuss with metal recyclers the potential for requirements to remove fluids and recyclable components such as tyres, windscreens, radiators, bumper bars, batteries and gas cylinders before presentation at weighbridge
- Identify composition of shredder floc through site audits and sampling
- Channel landfill levy funds into shredder floc solutions
- Undertake further research into the viability of alternative disposal options for shredder floc, including exploring cement kiln feedstock as a shredder floc outlet



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