End-of-Life Vehicle (ELV) processing

The briefing document accompanies the 2011 SMMT Sustainability Report, which you can find out more about at www.smmt.co.uk/sustainability.

Processing of an ELV – depollution

There are about 1,500 Authorised Treatment Facilities (ATFs) licensed by the Environment Agency and able to meet Directive standards to ‘depollute’ ELVs.

Hazardous fluids, such as petrol/diesel, oil, brake fluid, antifreeze, coolants etc are removed and collected in separate tanks.

Some can be re-used directly, and some after simple filtration or further processing. At the depollution point the batteries, wheels and tyres are also removed while pyrotechnic devices such as airbags are safely neutralised or removed.

Non-hazardous items may also be removed at this point if they can be more effectively recycled or re-used at this stage. For example catalytic converters contain high value metals and are best recycled separately from the rest of the vehicle structure.

To aid ATF staff in locating materials and components within the old vehicle, manufacturers make available detailed information on dismantling each individual model. For instance IDIS, the International Dismantling Information System, is free to ATFs and manufacturers are required to ensure a new model’s data is available within six months of market launch.

The purpose of IDIS is three-fold:

1. Provision of treatment information to enable the environmental impact of substances to be negated.

2. Identification of non-metallic materials that have potential for recycling, assuming favourable market economics.

3. Provision of data that enables safe working practices by treatment operatives.

Processing of an ELV – shredding and post shredding separation

Once the vehicle has been depolluted by the ATF, it will be either crushed into a cube or flattened and transported to a shredding site. Some ATFs will remove engines and gearboxes prior to crushing where there is an economic incentive to do so.

The shredder tears the crushed vehicle into fist sized chunks and various techniques are used to extract the different materials the vehicle was constructed from.

For example, air currents are used to separate light and heavy materials, magnets are used to extract ferrous metals, and ‘eddy current
separators’ used to extract non-ferrous metals. The remaining mixed materials may be further separated at a dense media separation plant, where other characteristics are exploited. For example, plastics can be separated in tanks of liquid that allow some material to float and some to sink. A series of ‘trommels’ (rotating mesh tubes), which separate the material by its size, or vibrating tables on which some materials move further than others, all allow for further material separation.

Markets for recycled ELV materials
Many waste streams from ELVs removed at the depollution stage can go on to serve useful purposes. New uses are being found all the time.

Some individual components from ELVs can be re-used directly or profitably remanufactured and used for servicing and repairing other vehicles, where there is a consumer demand.
- Ferrous metals make up the largest amount of material recovered from an ELV and are in great demand globally, as are non-ferrous metals, for recycling into a raw material.
- Glass is extracted from the shredding process and can be used as an aggregate substitution for virgin materials.
- Fluids like oils can be reprocessed and re-used.
- Batteries are recycled.
- Tyres have an increasing number of recycling applications, including protective surfacing for children’s playgrounds or used as a fuel in cement kilns. Latterly, the Highways Agency has begun using compressed cubes of used tyres for road construction. They expect that one project alone will absorb 500,000 tyres.
- Wheels, both alloy and steel are sent for recycling.
- Lead wheel balance weights are recycled.
- Residual material can also be used for energy recovery and in landfill sites for engineering purposes.

Closing the loop
Vehicle engineers are increasingly specifying parts to have a post-consumer recycled content. For instance:

Energy recovery
New technologies and processes will mean that increasing amounts of material will be usefully recovered from ELVs. However, a residual fraction will remain which, due to its nature, will not be able to serve any useful purpose but is not permitted to go to landfill. It is likely to have a high calorific value and would perform well in energy recovery for combined heat and power. The EU directive provides for an amount of energy recovery which is attributable to target attainment, but at present UK energy recovery capacity is too low to allow this to be fully realised.

New materials
As vehicles are designed to meet the CO₂ targets, new materials (carbon fibre, kevlar, biomixes etc) and changing ratios of existing materials may change the profit model of the recycling network. New and larger material markets need to be developed to ensure materials that have an ‘in use’ CO₂ benefit do not have a recycling penalty.

Battery end-of-life
As electric-capable vehicles gain a bigger market share, manufacturers are aware of the importance of end-of-life treatment of their batteries. Battery regulations now require that vehicle manufacturers report the number of batteries placed on the market. There are different responsibilities for portable, industrial (including electric vehicles) and automotive starter batteries. In all cases, the last owner will be signposted to the most suitable authorised treatment facility where batteries are disposed of in an appropriate manner, free of charge.

For further information, visit the SMMT sustainability website hub or contact us directly.