Transmitted by the expert from OICA

Working paper No. **EFV-09-05**
(GRPE Informal Group on EFV,
9th Meeting, 15th February 2011)

OICA comments on EFV-08-05

Parameter: Recycling

Formatted: Font: 22 pt, Dutch (Belgium)

Parameter: Recycling

Formatted: Dutch (Belgium)

Formatted: Dutch (Belgium)

Reference Document:
EFV 07-04: Recycling

Automobiles are the most recycled consumer product. By weight, the typical passenger car consists of about 75 percent metals that are 100% recyclable. The metals used in car bodies are often made with significant percent recycled metals. All steel products contain recycled steel because steel scrap is a necessary ingredient in the production of new steel. Metal scrap is derived not only from automobiles but also from steel cans, appliances and construction material.
Recycling is an effective way to reduce greenhouse gases. When we recycle, we avoid the greenhouse gas emissions from landfills and incinerators. We also reduce the need to extract new resources from the earth and replace logging, drilling, and mining of virgin materials with recycled materials that we no longer want. This greatly reduces the energy it takes to process and manufacture new goods. The recycling of most metals is done for economic reasons anyway. Thus recycling is not so much a question of the vehicles but of the functioning of the market and the available infrastructure. This is best influenced by the end-of-life economic operators and where necessary the governments (e.g. by

Deleted: 65

Deleted: steel and iron

Deleted: steel

Deleted: is

Deleted: about 25

Deleted: steel

Deleted: Many internal steel and iron parts are made using even higher percentages of recycled steel

Deleted: Steel

Comment [WPS1]: This is not only a steel story but applies to most metals.

closing alternatives landfilling and by ensuring a functioning vehicle de-registration process linked to a proper end-of-life treatment / sales contract).

The life of automobile includes different phases beginning with the extraction of raw materials and ending with the disposal of vehicle. In all life phases, processes transform energy or material from one phase to another. After usage, the Vehicle is subjected to disposing and recycling. But recycling is not always the best strategy. Some factors should be considered to find out the impact of recycling. Recycling steel saves energy and natural resources. The USA steel industry annually saves the equivalent energy to power about 18 million households for a year. Recycling one ton of steel conserves 2500 pounds of iron ore, 1400 pounds of coal and 120 pounds of limestone.

Some procedure should be followed during the recycling of automobiles. Initially all the contaminated and hazardous substances should be removed. It may include battery, fuel, oil, coolant, windscreen, washer fluid, airbag, and air-conditioning. It will promote the safe and hazard free working environment. After that depending on the region and the market demand for second hand parts further parts may be dismantled. After that the vehicle will be shreddered. In post-shredder treatment valuable materials may be separated. These steps will be followed by the recycling, recovery or disposal of the different material streams. All the material separated will be intended to transport the processing, disposal, reuse as per the material type, reusability, and disposability.

Rating Parameters	Weightages Assigned
Recycling strategy available	15 %
Compliance to substance restrictions	15 %
Development of product's recycling/reuse/scrapping manual and coding of recyclable parts in vehicle (IDIS)	10 %
85% Recyclability of vehicle according to ISO 22628 (note: higher recyclability is not necessarily positive)	60 %

Provision of recycling strategy during vehicle design: A recycling strategy at the end of life should be developed in order to ensure the complete disposal of the scrap without leaving any burden on the environment. For example, the European directive on End-of-Life Vehicle, which from 2003 requires end-of-life operators to remove heavy metals such as lead starter batteries and mercury from vehicle components. The directive also dictates ELV material recovery or re-use rates of over 85% of the whole vehicle from 2006 and over 95% from 2015.

Compliance to Substance Restrictions: Policies on restrictions on the use of the hazardous substance in vehicles () like lead, cadmium, mercury etc. should be helpful in this regard. Compliance to these substance restrictions is ensured by the manufacturer's supply chain management that requires material and substance reporting against a list of globally

Deleted: the windows, doors, seats, bonnet, bumper, window rubbers, dashboard, front and rear lights and any object left behind on the car is to be removed

Deleted: Thirdly, the complex assemblies like engine, gearbox, transmission system, axles and exhaust system are removed. In the final workstation the shock absorbers detached from chassis, all remaining material and parts will be removed from chassis including radiator, wiring, heater, windscreen wiper and fluid tank. After this a final inspection will be done to ensure the removal of all material

Deleted: .

Deleted: materials

Comment [WPS2]: Recycling is not only a vehicle design aspect

Comment [WPS3]: Environmental friendly materials not defined: Environmental friendliness ... [1]

Deleted: Provision of r

Deleted: recycling

Deleted: during vehicle design

Deleted: Use of Environmentally friendly material ... [2]

Deleted: Development of product's ... [3]

Deleted: 10

Formatted Table

Deleted: Extent of

Comment [WPS4]: Recycling strategy is not only related t ... [4]

Deleted: At very first of the vehicle design, the

Deleted: , the

Comment [WPS5]: The decision what is recycled in ... [5]

Deleted: Environmentally sound scrapping only happens to t ... [6]

Deleted: vehicle manufacturer

Comment [WPS6]: Environmental friendly materials not d ... [7]

Deleted: Use of Environmentally friendly material

Deleted: The uses of materials that cause less environment ... [8]

Comment [WPS7]: RoHS does not apply to vehicles

Deleted: ROHS

agreed substances to be monitored (GADSL). This reporting has to be done by all suppliers along the global supply chain in a joint system (International Data Management System, IMDS). The manufacturer has to show that this process and system is set up.

Development of product's recycling/reuse/scrapping manual: The primary responsibility of the manufacturer is to provide the scrapping, reuse or recycling manual of the product so as to facilitate the scrapping process at the end of the product's life. It is necessary for the environmentally sound product disposal. Global automotive industry is typically providing these information in the International Dismantling Information System. This system makes it easier to dismantle end-of-life vehicles.

Extent of Recyclability of vehicle: The Recyclability level is the percentage of the total weight of the vehicle, which can be recycled easily, economically and in environmentally sound manner. Higher the recyclability levels of the vehicle, better it is and higher marks will be awarded to it. However, as there are increasing energy demands the higher the recycling rate no further incentive should be provided if going beyond 85%.

Sr. No.	Recyclability level in % [(Weight that can be recycled *100)/total weight of vehicle]	Score awarded to vehicle in %
1	Less than 60	0
2	From 60 up to 74	15
3	From 75 up to 84	45
4	From 85	60

So, the End of Life of Vehicle Strategy for EFV should be defined on following points:

- To define recycling mechanism; identify present usage of various materials for construction of vehicle (according to ISO 22628).
- Identify non-recyclable materials that go in vehicle construction (according to ISO 22628).
- Comply to regional substance restrictions.
- The criteria should be inline with the regulations on ELV

The notion behind this is to encourage the vehicle manufacturer and material and equipment manufacturers to control and reduce the use of hazardous substances. By this way the manufacturers will be encouraged to integrate an increasing quantity of recycled material in vehicles to develop the markets for recycled materials. However, the cost for recycling is also a major issue. Thus, the recycling Industry plays an important role in the efficient and ecological disposal of the waste motor vehicles. Additionally it will conserve natural resources, reduce air pollution, water pollution and solid waste generation.

Deleted: More and more use of recycled material will be helpful to reduce the cost and energy.

Comment [WPS8]: Part coding makes no sense if the recycling strategy is based on automated processes where materials are separated based on their characteristics in a post-shredder treatment process

Deleted: and coding of recyclable parts in vehicle

Deleted: The material should be marked with suitable ID mark.

Deleted: sort materials taken from

Deleted: d

Deleted: This manual should also provide the information and the sequence of operations to be performed during dismantling and recycling.

Deleted: 30

Deleted: up to 95

Deleted: 45

Deleted: 5 ... [9]

Deleted: , hazardous, flammable, and toxic

Formatted: Bullets and Numbering

Comment [WPS9]: RoHS does not apply to vehicles

Deleted: <#>Mark the components during production suitably which will help to differentiate during the dismantling of vehicle¶

Deleted: and RoSH (Restrictions on the use of the hazardous substance)

Deleted: ¶

Formatted: Justified, Bulleted + Level: 1 + Aligned at: 0.63 cm + Tab after: 1.27 cm + Indent at: 1.27 cm

Comment [WPS10]: Recycling can be done based on a post-shredder treatment approa ... [10]

Deleted: This is also to promote the design for dismantling ... [11]

Deleted: automotive

Comment [WPS11]: In Europe ELVs represent 1% ... [12]

Deleted: As automotive industries are representing ... [13]

****

Page 2: [1] Comment [WPS3] **Wulf-Peter Schmidt** **11/20/2010 5:19:00 PM**

Environmental friendly materials not defined: Environmental friendliness is not an inherent material characteristic, i.e. a low energy material can be worse for the environment if significantly heavier than the alternative materials

Page 2: [2] Deleted **Wulf-Peter Schmidt** **11/20/2010 5:17:00 PM**

Use of Environmentally friendly material	15%

Page 2: [3] Deleted **Wulf-Peter Schmidt** **1/1/2011 10:41:00 PM**

Development of product's recycling/reuse/scrapping manual and coding of recyclable parts in vehicle

Page 2: [4] Comment [WPS4] **Wulf-Peter Schmidt** **11/20/2010 5:20:00 PM**

Recycling strategy is not only related to vehicle design.

Page 2: [5] Comment [WPS5] **Wulf-Peter Schmidt** **11/20/2010 5:22:00 PM**

The decision what is recycled in what way is taken by the end-of-life operators in line with the regional legislation.

Page 2: [6] Deleted **Wulf-Peter Schmidt** **11/20/2010 5:21:00 PM**

Environmentally sound scrapping only happens to the material, which can be recycled. The non-recyclable material in the automobile remains in the atmosphere. It should be decided early the recycling of aluminum, steel, plastic components. Therefore, the strategy for recycling should be developed in advance.

Page 2: [7] Comment [WPS6] **Wulf-Peter Schmidt** **11/20/2010 5:29:00 PM**

Environmental friendly materials not defined: Environmental friendliness is not an inherent material characteristic, i.e. a low energy material can be worse for the environment if significantly heavier than the alternative materials

Page 2: [8] Deleted **Wulf-Peter Schmidt** **11/20/2010 5:29:00 PM**

The uses of materials that cause less environmental damage are a popular measure when performing design for Environment. Since most of the products today are cost optimized, a change in the material composition of a product potentially increases the cost of that product.

Page 3: [9] Deleted **Wulf-Peter Schmidt** **11/20/2010 5:26:00 PM**

5	Above 95 %	60

Page 3: [10] Comment [WPS10] **Wulf-Peter Schmidt** **11/20/2010 5:40:00 PM**

Recycling can be done based on a post-shredder treatment approach to the same or higher levels and with higher efficiency as shown in Life Cycle Assessments.

Page 3: [11] Deleted **Wulf-Peter Schmidt** **11/20/2010 5:39:00 PM**

This is also to promote the design for dismantling, reuse and recovery – in particular the recycling of end – of-life vehicles, their parts, components and material.

Page 3: [12] Comment [WPS11] **Wulf-Peter Schmidt** **11/20/2010 5:41:00 PM**

In Europe ELVs represent 1% of the total waste.

Page 3: [13] Deleted **Wulf-Peter Schmidt** **11/20/2010 5:40:00 PM**

As automotive industries are representing the large portion of industrial production streams, advancements in recycling will show significant effect on the global environmental policies.