European Automobile Manufacturers Association

ACEA Comments on the public consultation on alternatives for DEHP Applications for authorisation

The European Automobile Manufacturers' Association (ACEA) represents the fifteen Europe-based car, van, truck and bus makers: BMW Group, Daimler, DAF, Fiat, Ford of Europe, General Motors Europe, Hyundai Motor Europe, Iveco, Jaguar Land Rover, PSA Peugeot Citroën, Renault, Toyota Motor Europe, Volkswagen Group, Volvo Cars and Volvo Group.

In general, ACEA members are progressing a substitution strategy for the usage of DEHP in their current products, but due to the number of parts involved, the revalidation of these parts, the availability of alternatives and the traceability of parts in this very complex supply chain, substitution is not likely to be completed by the sunset date.

To ensure that the automotive industry can successfully manage the transition to alternative plasticisers, **ACEA supports authorisation for a minimum of 4 years after the sunset date for current vehicle parts and an unlimited exemption for past model service parts**. The unlimited exemption we request is not limited to DEHP and should be applied to all substances that may undergo authorisation in the future.

Both requirements are discussed within the attached Annex in order to further define the issues the automotive industry is facing and to demonstrate the potentially serious impacts that would arise should an authorisation and exemptions not be granted.

We hope the Committees will find this information useful and welcome further consultation with representatives of the automotive industry to help provide a sensible and pragmatic solution.

With best regards

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ACEA – European Automobile Manufacturers Association

Brussels, 8 January 2014

Attachment

Attachment to the ACEA Comments on the public consultation on alternatives for DEHP Applications for authorisation

1. INTRODUCTION AND KEY INFORMATION ON THE AUTOMOTIVE SECTOR

Introduction

This Annex forms the ACEA response to the public consultation on alternatives for Bis(2-ethylhexyl) phthalate (DEHP) for the following applied for uses:

#1: Formulation of DEHP in compounds, dry-blends and Plastisol formulations; and

#2: Industrial use in polymer processing by calendering, spread coating, extrusion, injection moulding to produce PVC articles [except erasers, sex toys, small household items (<10cm) that can be swallowed by children, clothing intended to be worn against the bare skin; also toys, cosmetics and food contact material (restricted under other EU regulation)].

ACEA is aware that the purpose of the public consultation is to gather additional information on possible alternatives for the uses applied for and assumes this is not limited to the provision of information where a possible alternative is **not currently** available. In this context, it is necessary to consider that for the automotive industry to successfully manage the transition to alternative plasticisers, ACEA supports authorisation for **a minimum of 4 years after the February 2015 DEHP sunset date for current vehicle parts and, for past model service parts, an unlimited exemption would be required[1].**

With regard to current vehicle parts, the minimum period of 4 years is absolutely necessary to ensure that alternatives are thoroughly evaluated (to avoid failures in the field), to ensure that production volumes of vehicles are not affected, to ensure that the EU automotive market remains competitive on a global scale and to allow an efficient information exchange through a very long chain of suppliers.

For past model service parts, the need for an exemption is critical to ensure industry warranty obligations and legal type approval requirements are fulfilled (the lack of an exemption could have a particularly significant effect on SMEs, who are prominent in this sector).

Both requirements are discussed within this Annex (in the context of the overall industry structure) in order to further define and demonstrate the issues the automotive industry is facing and the potential impacts to the automotive industry should an authorisation not be granted.

[1] As discussed in Section 3, such an exemption should not be limited to the applied-for-uses, and is necessary not only for DEHP but for all substances used in the production of past model service parts which may undergo authorisation in the future.

Structure and importance of the EU Automotive Market

Vehicle manufacturing is a strategic industry in the EU, where 16.2 million cars, vans, trucks and buses were manufactured in 2012. In the same year, the sector employed 12.9 million people (representing 5.3% of the EU's employed population) and the 3 million high-skilled jobs in automotive manufacturing represented 10% of EU manufacturing employment (ACEA, 2013).

ACEA's members operate 208 vehicle assembly and production plants in 22 countries across Europe. In 2012, motor vehicle production in the EU-27 accounted for 19% of worldwide motor vehicle production and passenger car production accounted for 23%. The European automotive industry is truly a global player, delivering 6.6 million 'Made in Europe' vehicles around the world, and bringing in a €92 billion trade surplus. The €840.5 billion turnover generated by the automotive sector in EU 27 in 2011 represented 6.9% of EU GDP and the industry has ripple effects throughout the economy, supporting a vast supply chain and generating an array of business services (ACEA, 2013).

Figure 1 provides a breakdown of the EU automotive market (based on the ca. €800 billion turnover of the industry.

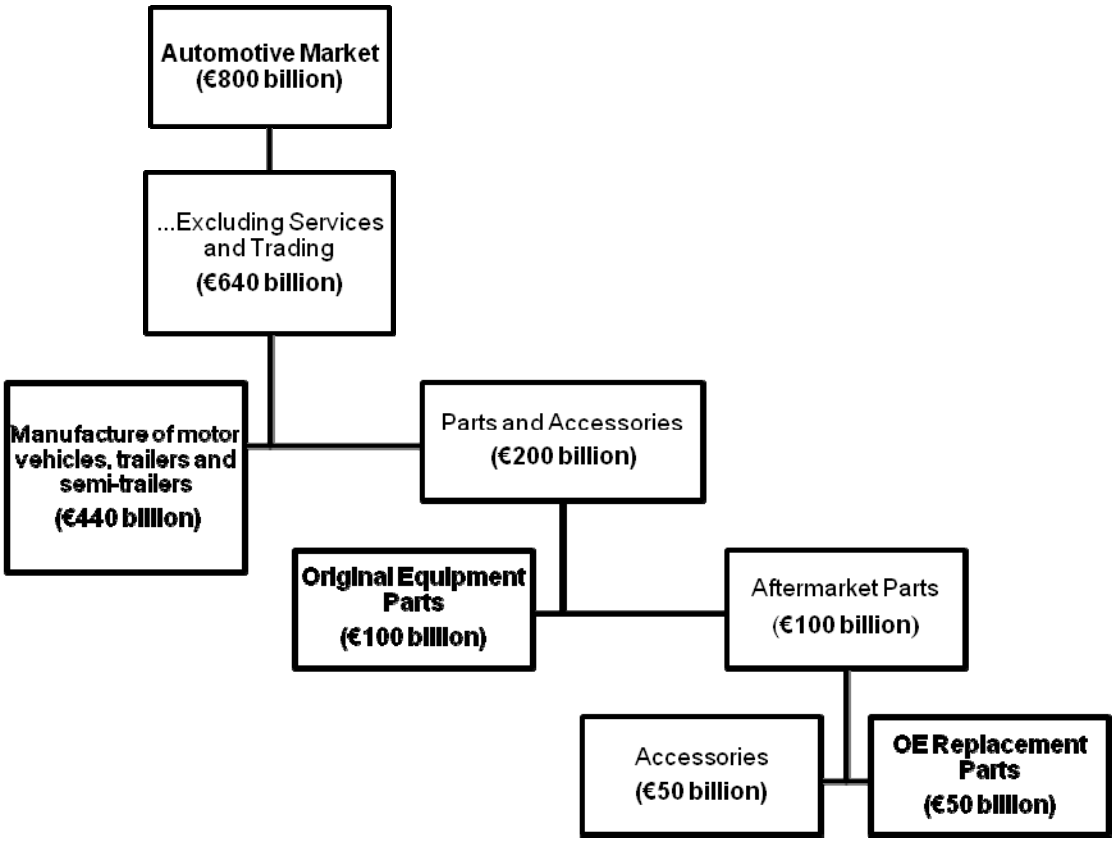

Figure 1: EU Automotive Market Breakdown (DG Enterprise, 2012a)

Automotive parts are generally defined as either:

- *Original Equipment* parts, which are used in the assembly of a new motor vehicle or are purchased by the manufacturer for its service network; or
- *Aftermarket* parts, which can be divided into two categories: **past model service parts** (which are automotive parts built or re-manufactured to replace original equipment parts as they become worn or damaged and accessories) and **accessories** (which are parts made for comfort, convenience, performance, safety, or customisation, and are designed for add-on after the original assembly of the motor vehicle) (DG Enterprise, 2012a).

The *manufacture of parts and accessories* accounts for around **€200 billion** (ca. ¼ of the market) and aftermarket parts is estimated at around half of this (€100 billion), split evenly between the independent side (accessories) and the original equipment side (past model service parts) (European Aftermarket Report, 2009; DG Enterprise, 2012a). As shown in Figure 1, the manufacture of **current vehicle parts** and **past model service parts** forms a significant proportion of the overall automotive market and this is perhaps not surprising when one considers the incredibly diverse nature of systems and components produced and used within the automotive industry. Typically, in a single vehicle, there are between 4,000 – 9,000 different **main** components and assemblies (without multiple entries for one specific part). The following infographics have been provided so one can better understand the scale of the parts and components used in automotive manufacture[2]. Figure 2 shows (in the main) a car dismantled into its constituent parts; Figure 3 shows the principal parts of a car engine, and Figure 4 shows two engine valves, broken down into individual components.

Figure 2: A car dismantled into constituent parts (Volkswagen AG, 2013)

[2] Please note: As these examples are **illustrative only** their technical accuracy has not been verified.

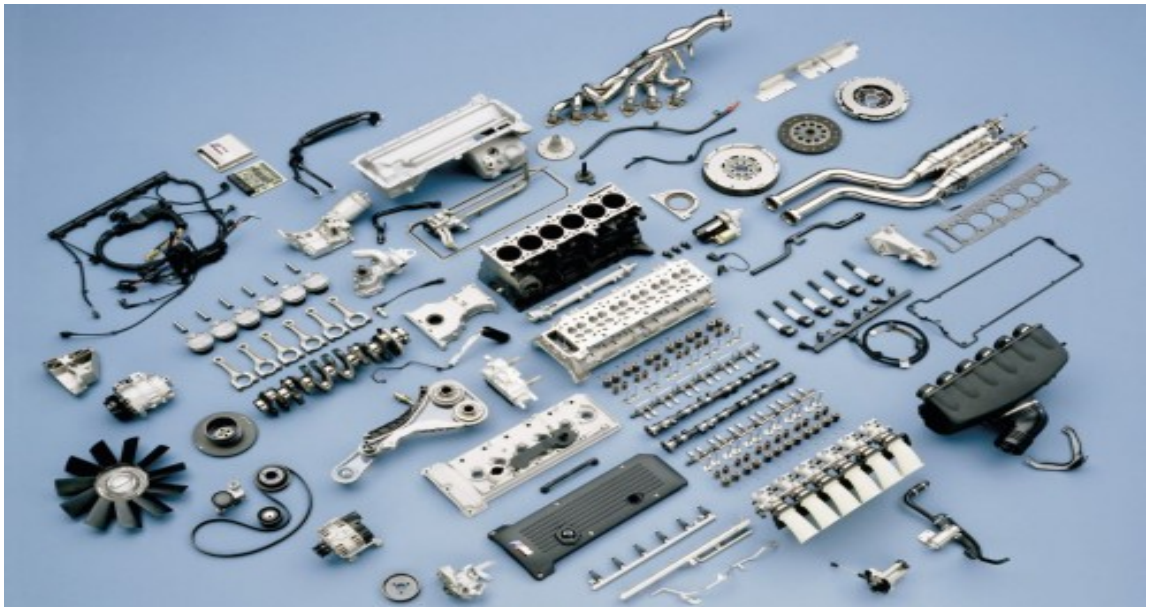

Figure 3: Principal engine parts of a car (HubPages, undated)

Structure of the supply chain

In addition to being one of the most economically important industries in the EU, the automotive sector is also one of the most technically complex. This high degree of technical sophistication within the industry has also characterised its supply chain structure, which has formed over the decades as companies have focussed on their core competencies to preserve high efficiency.

Automotive supply chains will typically evolve around Original Equipment Manufacturers (OEMs), who assemble vehicles and deliver them to dealers. The assembly is performed in a network of manufacturing plants. These plants do not merely put together vehicles but form a multi-tier manufacturing system including the manufacturing of such parts as exterior sheets and engines (Chandra & Grabis, 2007).

Traditionally, the value chain of the automotive industry can be said to be in a pyramid structure, as shown (simplistically) in Figure 4, below.

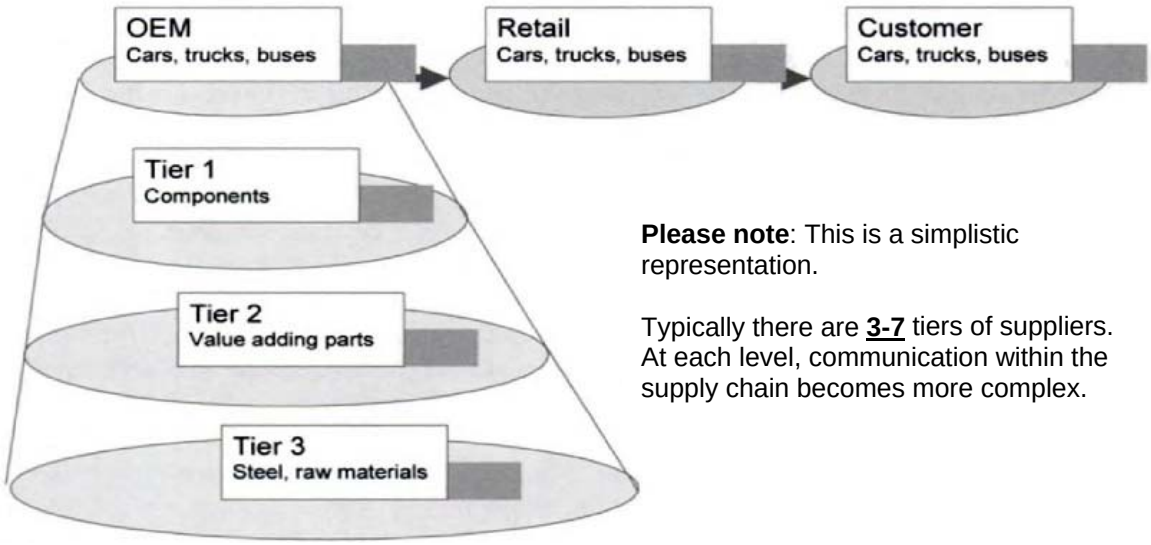

Figure 4: Basic structure of the automotive industry (Heneric et al., 2005)

Typically, around 75% of a vehicle's original equipment, components and technology are sourced from automotive suppliers (European Commission, 2013).

As reported by DG Enterprise (2012b), **Tier 1** suppliers are component manufacturers delivering directly to the final vehicle manufacturers or OEMs. These suppliers are typically responsible for the manufacture of separate technical units and components (such as the safety belts, tyres, glass, exhaust systems, replacement brake linings, etc.) and, as such, have the primary responsibility for seeking type-approval for them. As such, Tier 1 suppliers work closely with vehicle manufacturers/OEMs to design, manufacture and deliver these complicated automobile systems; although they hardly ever deliver their products to only one OEM. Tier 1 suppliers also tend to be large or very large enterprises originating from the USA, Japan, or Europe (but all active within Europe) and may be active not only in the manufacturing of motor vehicles, but also in other sectors such as electronics, mechanical and electrical engineering, information technology, steel, chemicals, plastics, metals and rubber, etc. These suppliers also have considerable turnover and the largest Tier 1 suppliers have over 1,000 subcontractors (mostly SMEs operating in lower tiers). A few SMEs can also be found in niche segments of the automotive market at this tier (e.g. body builders).

Tier 2 suppliers are companies that produce value-adding parts or more simplistic individual components (e.g. the housing of a fuel pump) in the sub-assembly phase. Tier 2 suppliers buy parts or raw materials (from Tier 3 and others) and deliver components to companies in the higher tiers. A significant proportion of SMEs in the automotive sector are generally found in this tier of suppliers.

Tier 3 and lower suppliers are companies supplying engineered materials and special services, to companies in the higher tier. They rank below Tiers 1 and 2 in terms of the complexity of the products they provide and SMEs can also be found in this tier of suppliers.

Use of DEHP in the sector

Historically, DEHP has been used extensively in the automobile industry as a plasticiser for polymeric and elastomeric parts and a recent survey in the industry has **identified several thousands of parts containing DEHP across all participants**. Typical applications include in wiring harnesses, hoses, weather strips, tapes, polymeric trim parts, labels, seals and gaskets which have been identified throughout all levels of the supply chain.

Perhaps most significantly (and of relevance to the applied for uses) is the substance's use in PVC parts, which has historically been at very high levels due to the cost effectiveness of DEHP and the other technical characteristics it displays, such as its plasticising efficiency, fusion rate and viscosity. Although not all PVC parts will be plasticised with DEHP, the benefits of PVC in general in automotive applications are widespread.

Essentially, PVC has both physical and chemical characteristics that make it difficult to replace in certain applications. The main benefits are the cost, weight and physical and chemical characteristics and the fact this material complies with all technical specifications in terms of flammability, plasticity/elasticity, durability, etc. The properties of PVC avoid problems in electric and electronic areas (i.e., short circuits) and are thus used in many safety applications.

ACEA members are phasing out the use of DEHP, although (as discussed further below) the industry also faces many challenges in this respect.

Key issues with current vehicle parts and past model service parts

With regard to the requests and requirements of ACEA concerning **current vehicle parts** it is reiterated that a minimum 4 year authorisation period should be granted to enable the transition to DEHP free materials for running series vehicles. If authorisation is not granted, the following impacts may need to be managed:

- Availability of DEHP containing parts could be affected;
- Introduction of new failure modes – e.g. unacceptable odour, photodegradation, high VOC emissions and low temperature flexibility
- Alternatives not evaluated thoroughly could lead to failures in the field;
- Non-EU material / component suppliers may be required to bridge the supply gap, to enable car production to continue; and
- Production volumes may be affected if parts supply is restricted.

To enable the automotive industry to continue to supply **past model service parts**, an unlimited exemption (not limited to DEHP, and not limited to the applied-for uses) is required due to the following reasons:

- Legal type approval requirements and minimum 10 year warranty obligation (availability of past model service parts) must be fulfilled;
- Stockpiling of past model service parts has only limited possibility: Storage capacity / availability , expiry dates e.g. for rubber parts;
- Re-development & re-validation is very costly and technically very difficult;
- Substitution of substances can cause changes in function, geometry, thermal durability and may have an unexpected impact on other related parts.

Both of these requirements and the surrounding issues are discussed individually below. These discussions should be read bearing in mind the context provided on the structure and importance of the EU automotive market, the vast array of parts and components manufactured, and the complex and intertwining activities of actors at all levels of the supply chain.

2. CURRENT PRODUCTION PARTS

At the present time, OEMs are facing enormous challenges – with ongoing globalisation, companies are competing against more competitors and deal with expanding individual customer requirements. Competition is also becoming more complex (Schmitt & Schmitt, 2013).

In order to meet customer requirements and remain globally competitive, the pace of innovation has accelerated, product lifecycles are getting shorter and the variety of different product variants is increasing. As a result, the ramp-up phase (i.e. the phase between the development and serial production) is of high importance as it is passed through more often. Indeed, for OEMs the number of ramp-up processes has tripled in the last two decades and, at the same time, the number of different vehicle versions had increased 61% (between 1999-2005) (Schmitt & Schmitt, 2013).

These tendencies are of major economic importance and a delayed product launch results in lost sales which cannot be compensated for due to shorter product lifecycles, especially since prices are higher shortly after entering the market. Furthermore, resources are tied into finding and implementing solutions generating additional costs. A vital cause for delays is fulfilling quality requirements. Most product flaws and defects originate from early product phases (Schmitt & Schmitt, 2013).

All less critical alternatives to DEHP that are known to cover the high demands and quality requirements of the automobile industry have different physical properties than DEHP, therefore a simple 1:1 substitution is not possible. Instead careful validation of both materials and components need to be performed to ensure the successful function of these components during their long-lasting lifetime.

Figure 5, below shows the result of a plasticizer diffusion and evaporation. It leads to the hardening of the plastic insulation, to the point that the slightest flexing causes the plastic to crumble apart. The desired insulation function has disappeared.

Figure 5: WIKI media commons; Dale Mahalko, 25 June 2011

The automotive industry has rigorous testing and validation procedures to prevent these failures reaching the customers. This means that a longer period of time may be required to effectively substitute the use of a particular substance. In the context of the authorisation of DEHP it is noted that, due to the sheer number of parts involved, the revalidation of these parts and the availability of alternatives, substitution is not likely be completed by the sunset date.

As discussed, thousands of individual components are used to manufacture automobiles, and (as indicated by the recent industry survey) many thousands contain DEHP. In phasing-out these components, the automotive industry must revalidate all relevant components and parts using suitable alternative plasticisers or materials. To implement such changes requires significant efforts and time from a variety of actors in the supply chain. Indeed, even identifying the original source of the parts is a very complex task - increasingly complicated supply chains have created a situation where parts' data is distributed across a wide network of suppliers' databases. The challenge of parts tracking in this environment requires maintaining data views across constantly-restructuring networks of information systems as new suppliers are contracted and subassemblies are outsourced (Robson et al., 2007).

Furthermore, what was not previously noted in relation to Figure 4 is the sheer number of companies operating at each level of the automotive supply chain and the potential for individual companies to also act at more than one level i.e. a single company may be a Tier 1 supplier to one company and a Tier 2 supplier to another (see Figure 6). Industry experts note that an OEM can have (on average[3]) between 1500-4500 Tier 1 parts suppliers and a Tier 1 supplier can have between 500-1500 Tier 2 suppliers. Combining the lower estimates with a conservative assumption that a Tier 2 supplier has 50 Tier 3 suppliers, suggests that even the shortest automotive supply chains have the potential for millions of potential supplier linkages for individual components. As a result, it is often very difficult for the end user to identify the country of origin.

[3] Depending on the size and sourcing strategy of the individual OEM.

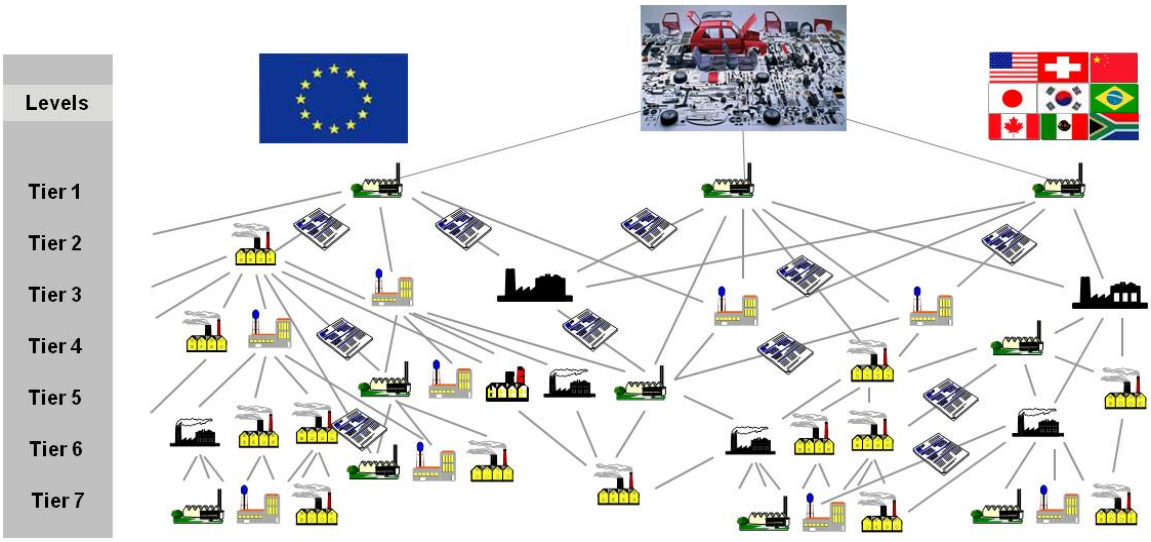

Figure 6: Schematic representation of the automotive supply chain (ACEA, 2009)

The traceability of parts is further complicated by the following issues (as discussed in DG Enterprise 2012a):

- Tracing capabilities are heavily customised to support existing trading partner relationships, with a lack of the transparency needed to track parts flows across the entire supply chain. With no means to trace defective parts to the subset of vehicles affected by them, auto manufacturers have, as a matter of safety, followed a sweeping approach in which vehicles of entire model years are recalled. This may be the single most important reason that recalls are so costly and inefficient ;
- Most components are currently traced by lot and stored at the point of manufacturing or assembly, rather than by serial number. Because of the lack of a one-for-one relationship in identifying the actual parts that make up the final assembly and the unique identification of the final assembly itself, this creates a blind spot in tracing a part genealogy. Also, while engines, air bags and other safety-related parts are traced by serial number, most existing traceability solutions for non- safety-related parts are not automated; and
- Traceability data is often stored in multiple applications, and seldom shared with supply chain partners. Different coding and presentational formats also increase the technical effort at the supplier side and make data capture difficult.

The above information also has to be considered within the framework of the overall phase of development for automobiles within the automotive industry, which is 3-5 years. It is for these reasons that the ACEA requests the minimum 4 year authorisation period for DEHP in the applied for uses following the February 2015 sunset date.

If authorisation is not granted, as discussed, the automotive industry will not have sufficient time to revalidate components containing DEHP, and subsequently the availability of DEHP containing parts could be affected. Furthermore, attempts to replace components containing DEHP with alternatives not evaluated thoroughly enough could occur if substitution were to take place within an accelerated timescale – such pressures could lead to failures in the field and later product recalls. As well as the paramount issues of

consumer safety, such recalls have the potential to damage carefully developed brand equity, spoil customers' quality perceptions, tarnish a company's reputation and lead to losses of both revenue and market share (Ciravegna, 2012).

It is pertinent to also consider that, given the difficulties that may be faced by EU manufacturers in producing alternative components by the sunset date, OEMs may be required to bridge the supply gap by importing more components and systems from non-EU material / component suppliers who are not covered under the auspices of authorisation requirements. This effect would also be magnified for EU based OEMs (i.e. those headquartered in the EU) who typically use 70-80% EU suppliers (contrasting with non EU OEMs who use ca. 20-50% EU based suppliers)[4]. Based on these figures - when one also considers that an EU OEM could be using up to 4500 different suppliers - up to 3600 of these suppliers may be based in the EU.

Furthermore, given the symbiotic nature of the automotive supply chain, and the sheer scale of use of DEHP containing parts in the sector, if the manufacturers are unable to bridge the supply gap for parts, the lack of availability of DEHP containing parts could affect vehicle production volumes which, when considering the economic importance of the automotive industry to the EU economy, could have widespread negative effects.

3. PAST MODEL SERVICE PARTS

As discussed above, past-model service (or 'aftermarket') parts form an important and economically valuable piece of the automotive supply chain (a more detailed breakdown of the aftermarket landscape can be seen in Figure 7). The production and supply of past model service parts essentially addresses a major challenge in the automotive industry with regard to the different lifecycle periods associated with entire vehicles versus their integrated components (i.e. as the life cycle of a vehicle is significantly longer than the lifecycle of, for example, embedded electrical components, these will need to be replaced during the vehicle's lifetime, and therefore past model service parts need to be available to the consumer).

Typically, past model service parts are provided during the production life of the vehicle but also for a **minimum** of ten years after serial production has finished. This period can often extend to the lifetime of a vehicle which was produced thirty or more years ago.

[4] These figures are based on a recent investigation the automotive industry has performed in order to better understand the complexity of its supply chain.

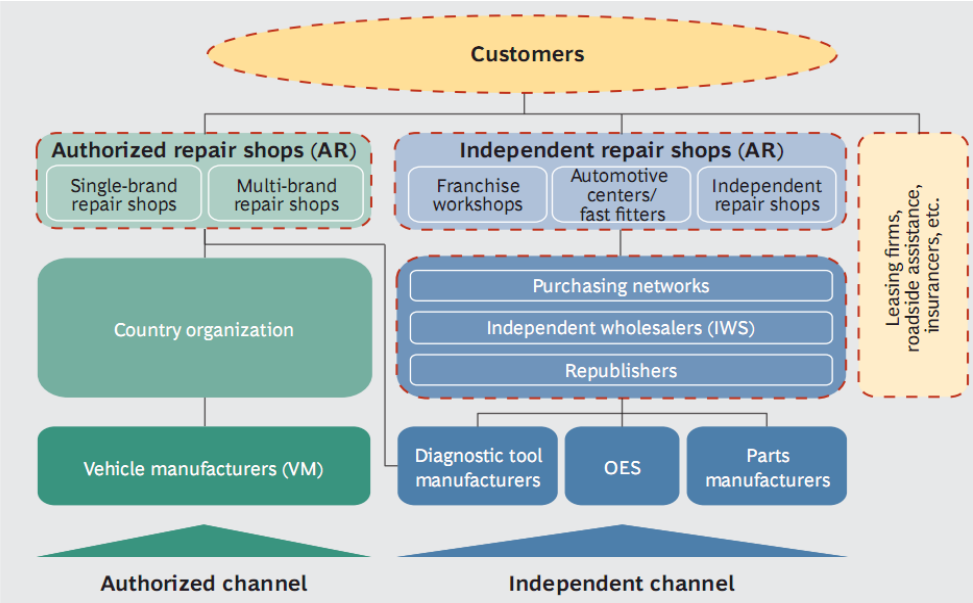

Figure 7: Overview of European aftermarket landscape (divided into 'authorised' and 'independent' channels) (BCG, 2012).

As can be seen in Figure 8, ca. 36% of the EU passenger car fleet (which, based on an overall figure of 224 million (from ANFAC, 2010) equates to ca 80 million cars) is over 10 years old. When one considers the age of the fleet, the importance of guaranteeing an efficient past model service parts supply beyond the end of serial production cannot be over-emphasised. Essentially, long supply periods are vital to offer a high degree of service for many million EU consumers.

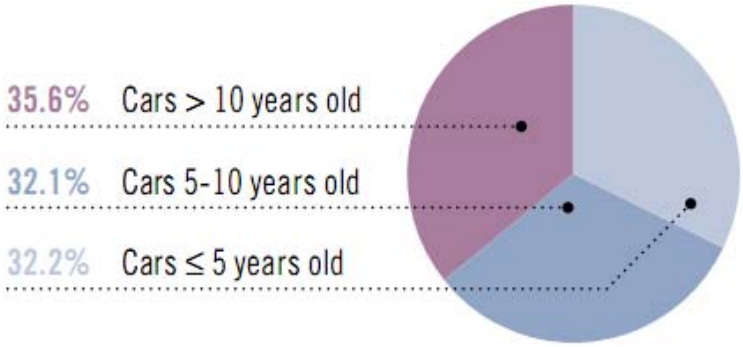

Figure 8: EU Passenger car fleet (% share by age in 2010). Note: Information from 12 EU member states where information was available (ACEA, 2013)

As parts cease production for running series / volume manufacture, quite often the tooling and bill of designs are transferred from a large manufacturer to another supplier (usually an SME) to enable low volume manufacture of spares to continue, extending the serviceable life of the vehicle.

These SMEs have the technical capabilities to produce the past model service parts according to the original method; but are likely to lack the expertise necessary to develop and test an alternative spare part (as would be the necessary case if no exemption to the use

of DEHP in these parts was granted[5]). Changing the plasticiser used in the current past model service parts is not a simple, straightforward task; it requires serious efforts for development and testing, which is in many cases neither economically nor technically feasible when one considers the low production volumes of these parts. Furthermore, distributing the costs of development and testing between such a small number of products would drive the prices of past model service parts produced by EU manufacturers to an excessively high level, and only seek to encourage the import of components and parts from outside the EU. Furthermore, the re-validation of the altered spare part has to be based on the original vehicle, which in many cases may not be available to the spare part manufacturer. In addition, each model has been tested for safety; reliability etc. with the past model service parts currently in production containing DEHP, there is no guarantee that the same standards would be met after changing the plasticiser. Substitution of substances can cause changes in function, geometry, thermal durability and may have an unexpected impact on other related parts. Consequences of failing to meet the original standards cannot be overstated when considered in the context of safety critical applications (DEHP is used in many safety critical parts).

The impacts of the substance having to be phased out by the sunset date may have considerable impacts throughout the supply chain (including on consumers), causing overall business disruption, as well as potential problems related to disposal of unsold parts. In addition to the aforementioned concerns, a decrease in the availability of past model service parts could also cause an increase in the dangerous import of counterfeit automotive parts. This is a particular concern at this time as Europol (2013) have recently reported that automotive parts (such as counterfeit brake pads, tyres, suspension components, steering linkages and other accessories) are being distributed and sold to consumers in greater volumes. Not only could this be a major concern for the health and security of consumers but it could also threaten legitimate EU suppliers.

There is also no guarantee that a substance used as a replacement for DEHP (e.g. other phthalate plasticisers also under scrutiny) would not face the requirements of authorisation in the future meaning the industry would again have to also repeat expensive requalification and remanufacturing campaigns (similar issues could also be relevant for other substances used in past model service parts, which may undergo authorisation in future - this further justifies the need for an unlimited exemption for past model service parts, not only for DEHP, but **for all substances**).

[5] These arguments stand not only for DEHP, but are also relevant for any other substances used in the manufacture of past model service parts which may undergo authorisation in the future.

4. CONCLUSION

For the automotive industry with its very long and complex suppliers chain to successfully manage the transition to alternative plasticisers, current vehicle parts manufacturers support an authorisation for the continued use of DEHP for a minimum of 4 years after the February 2015 sunset date.

Manufacturers of service parts for past models require an unlimited exemption, due to the potentially long service life of these vehicles and the need to ensure that their safety is not compromised. This exemption is also essential to ensuring that industry warranty obligations and legal type approval requirements are fulfilled. Although the ACEA request this unlimited exemption in the context of DEHP, it must be emphasised that our general wish and recommendation is that an exemption is extended to all substances which undergo authorisation in the future (and is not limited to any 'applied-for uses'). In this context, we would seek to obtain this general exemption for past model service parts in a similar manner as to the End-of-Life Vehicles Directive Annex II exemptions (e.g. we would propose adding to REACH Annex XIV a **repair as produced clause for each substance listed on Annex XIV** such as "Substances for past model service parts that are manufactured after the sunset date, which are used for vehicles that ceased production before the sunset date shall be exempted from the provisions of Article 56, REACH").

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