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VDMA reply to the public consultation on the Circular Economy

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1. Introduction

With these comments the German Engineering Association (VDMA) would like to supplement and elaborate the replies given in the public consultation on the circular economy. Therefore, this document follows the structure of the questionnaire focussing on the production, consumption and waste phases and identifying barriers and solutions from the point of view of the capital goods sector.

How is mechanical engineering connected to the circular economy?
Mechanical engineering

- **produces:** machines that will eventually be reintroduced into the cycle either as product or material
- **enables production:** by providing cutting-edge machinery for complex production systems and for resource- and energy-efficient consumer good production
- **enables recycling:** with the help of modern recycling and waste treatment technology
- **is a consumer:** exercising purchasing power about what type of material will be used in machinery production

2. General remarks

VDMA considers striving for a circular economy as a key element to increased resource efficiency. As a sector we are operating and sourcing on global markets and, as such, are part of a complex global value chain. The industry's exports account for 76% of output on average, making it not only highly export-oriented, but also extremely successful globally. Taking into account that Europe can undoubtedly not become self-sufficient in raw materials, access to raw materials and security of high quality raw material supply at stable prices is crucial for our companies that have fixed material costs of up to 45%. We consider this initiative important for highlighting that resource efficiency and implementing the circular economy can help reducing raw materials dependency and also provide businesses with opportunities.

3,100 member companies and over 1,000,000 employees in the sector produce high value, high technology, durable, investment-intensive products for the business-to-business trade. By default capital goods are repairable, upgradable, often reusable and with a lifetime of often 10, 20 or even more years. Remanufacturing is a long-standing business model in the capital goods sector. The main material input for producing the final product are semi-finished parts consisting to a high degree of metals. As a highly material-intensive sector, companies are driven to use resources efficiently in order to maintain their competitiveness. Capital goods distinctly differ from consumer goods regarding their customer base, regularly customised and small unit production as well as its application range.

Our sector's direct contribution to the circular economy stems from providing technological solutions to environmental challenges along the entire value chain. In order to establish a circular economy it is indispensable to rely on efficient and innovative technology. The high level of innovation in the industry is also reflected by the fact that VDMA member companies are currently the world market leader in 18 of the 32 product fields in mechanical engineering. This includes designing products that are long-lasting and that use resources efficiently during their operation as well as optimising production locations and processes. Therefore, the circular economy provides opportunities for the capital goods sector and its 86% share of small and medium-sized enterprises.

Manufacturing is undergoing far-reaching change in the context of Industrie 4.0 bearing opportunities for the circular economy. Modern factories are already far-removed from the image of smoking chimneys. They are clean, resource-efficient and offer attractive working environments. With the information from the many sensors used in machinery and production systems (manufacturing big data), the virtual image of the real processes is becoming ever more accurate, enabling better analysis, optimisation and decision-making – and finally a genuine reduction in energy and materials consumption (for example, by detecting inefficiencies and energy waste in real time). This is turning the ideal of a clean urban factory into a realistic vision, as some Industrie 4.0 pilot factories have already shown. New business models and services will contribute to more efficiency in value chains and during the life-cycle of equipment and products. For example, there is also a lot of potential in the field of remote maintenance and condition monitoring, which also makes factories even cleaner and more efficient – without technicians having to travel to the site. Industrie 4.0 means sustainable and competitive production of the kind we need to advance manufacturing and to re-industrialise Europe.

Current studies in the mechanical engineering sector suggest that because of the high pressure on production costs, there is no major potential for material efficiency increases. However, Industrie 4.0 may allow for optimisation and tapping into remaining potentials. For example, new business models enable through better monitoring and learning about actual uses to bring down life-cycle costs of products.

A policy framework that makes a real difference to manufacturers leaves room for innovative capacity, creativity and taking responsibility. This is a challenge in the current dense regulatory environment. The regulatory design for the circular economy needs to be carefully constructed. Non-regulatory or more flexible regulatory approaches become more important. Not hindering innovation, creativity and avoiding design control, means affording companies more responsibility in meeting the political objectives. For the capital goods sector, the Machinery Directive is a successful regulatory approach of setting objectives in the Directive and underpinning these with voluntary standards.

3. Production phase (production design and production process)

How to avoid barriers in the production phase:

- Approximately 53% of machinery is exported to non-EU countries. At the same time, many of the processed parts included in the machines may be imported. Complex value chains are at the heart of today's manufacturing realities. Therefore, the European **circular economy concept must take an open mind-set and work towards global approaches** in order to be successful in the long-run.
- **Distinguish between capital and consumer goods** with regard to product properties as capital goods are by default durable, repairable, upgradable and often reusable.
- Next to the environmental objective at stake, **product functionality, cost-efficiency and technology neutrality must be overriding principles** in product policy.
- **Maintain the life-cycling approach of the Ecodesign Directive** and aim to minimise lifecycle environmental impacts. Don't decouple waste phase thinking from life-cycling thinking.
- Measures aiming at preventing waste must take priority over reuse, recycle, recover, remove. Because of the longevity of capital goods, the use phase is most relevant in this regard.
- A targeted and appropriate policy mix of legal requirements, voluntary standards and design check lists, incentivising voluntary use of environmental management systems, industry-initiatives, extended producer responsibility is needed.

- Energy efficiency has been dubbed a primary political objective in the Energy Union strategy. This means there is merit in using innovative materials or composites to achieve more energy efficient products. Industry has been investing according to this political objective. While respecting a high health and safety level, **circular economy policy must strive for consistency with energy efficiency objectives.**
- VDMA sees no need for action in the field of making available reliable data on material flow across value chains. If deemed necessary, this needs to be coordinated by the concerned industry partners. The EU can contribute towards offering political guidance by providing European wide macroeconomic indicators on resource efficiency and the circular economy.

The following concrete actions are supported in the production phase:

- **Encourage existing innovative business models** such as remanufacturing and leasing which support the development of the circular economy in the field of capital goods[1]. For many years already and throughout different segments of mechanical engineering these business models enable lifetime extension and reuse of machines and parts.
- **Apply the "repair as produced"-principle** in order to allow for spare parts supply by manufacturers, avoiding unnecessarily induced premature end of life. The availability of spare parts is settled contractually in mechanical engineering functioning as a commercial warranty for the minimum life span.
- **Adopt a forward-looking approach to rule-setting taking** into account the opportunities of digitalisation. Industry 4.0 imposes totally new requirements on production systems and machines. They must be adaptable, since the products to be manufactured may change at any time. The result is that production is becoming more individual, more flexible and faster. Rigid product legislation is at odds with this trend. This requires moving away from product to system level regulation.
- **Addressing resource efficiency in sector-specific BREFs** in the context of the Industrial Emissions Directive can deliver better results for some application that do not fit a narrow product legislation. Example: Industrial Emissions Directive (IED) and industrial ovens.
- **Measures on sustainable sourcing should be aimed at the upstream level**, at the entry point for materials in the supply chains. Traceability at downstream level can neither be secured nor enforced. Aim to establish global initiatives.
- **Promoting cooperation across value chains** can be useful in sectors where there is no such dialogue established yet. Cooperation between product producers and recycling technology suppliers and operators to find better recycling solutions should be done by European standardisation. Look to the cooperation in the CEN project on solid recovered fuel for a best practice (EN 15357 to 15590), which is a future ISO project. The main advantages to handle quality specifications via European or international standardisation projects are: ensuring market relevance by bottom up approach, good involvement of industry and potential users, improvement of competitiveness of European industry and a coherent standardisation system in Europe.
- The capital goods sector is fully in the scope of the Ecodesign Directive. The sector is either directly or indirectly affected by half of the 50 product groups. VDMA supports the life-cycling approach of the Directive. **The Ecodesign Directive is one important tool in the tool box to achieve the circular economy but is not the silver bullet to it.** When moving to circular economy related legal product requirements in the implementation of the Ecodesign Directive, take into consideration, for example:
    - timeline: underlying technology is locked-in throughout the lifetime of a product. Good recycling practices in 15 - 20 years time are not known yet. It is most likely

[1] Learn more about existing models of remanufacturing in the capital goods sector here: http://www.skf.com/ph/services/remanufacturing-services/index.html and here: http://www.mturemantechnologies.mtu-online.com/mtu-reman-technologies/index.de.html

that products will not be recycled in a country that has installed the most recent recycling technology. Products that were designed for recycling risk not be adequately treated.
- changing consumption patterns: closing the loop 100% is not possible with constantly rising demand because of a growing world population. Rebound effects need to be taken into account.
- fluctuation of criticality: the criticality of a raw material may change throughout the product's lifetime (e.g. due to a shift in technology and hence on the demand side). Criticality is an individual value and not limited to geological availability. Be cautious not to block innovation in this area.
- lack of implementation in other areas of legislation: There is no added value in redesigning products for reuse or recycling while landfill of recyclable products is still allowed in many countries.
- measurability and enforceability: It may proof difficult to identify recycled content for market surveillance authorities.

4. Consumption phase

Avoid creating barriers in the consumption phase by taking into account:

- **Investment decisions in the capital good sector are not driven by design or life-style** but rather functionality, reliability, durability, longevity, productivity, resource- and energy efficiency, cost-efficiency.
- **Industrial customers do not buy off-the-shelf products but often order customised, application-specific single unit machinery.** In the area of mass produced goods, labelling can add to transparency and trigger behavioural change. Third-party certification is not supported, adding only bureaucracy and costs without changing product liability from producer to the issuing certifier.
- One-dimensional labels are not an option for complex capital goods. Instead, the **purchasers need to receive better advice on why investment in environmentally-friendly machines pays off over the product's life cycle**.
- In the area of digital solutions, distance repair and maintenance services have been established as part of contractual obligations. **Industrie 4.0 will bring more digital solutions to manage the production chain more resource efficiently**. Products will become more and more product-service hybrids where function and value-added is defined by software and service components.
- Circular economy policy framework should cover both the production and consumption side. One dimensional policy making would lead to ineffective, incoherent measures without achieving the environmental benefit.

These concrete actions are supported in the consumption phase:

- **The added value for the industrial customers** of circular economy ready products needs to be analysed to ensure market uptake.
- **Economic incentives can stimulate investment.** Good practices are voluntary agreements such as the German approach on allowing tax breaks for energy-intensive industries in return for implementing an energy and environmental management system (ISO 50001; ISO 14001).
- **Information on life-cycling costs should be made available.**
- **Public procurement should prioritise the most economic costs based on life-cycling calculation** rather than prioritising the most economical bid.

5. Waste phase

These concrete actions are supported to overcome barriers in the waste phase:

- The lack of sufficient volumes of recycled secondary material is a barrier to the establishment of a secondary raw materials market. Modern recycling technology with sensor system requires 40.000 tons of total input for economic operation. **Fully implementing the circular economy means changing the perception of waste to product.** Following this logic, moving towards a European approach to waste treatment would make ecological and economic sense. Keeping the importance of maintaining a high health and safety level in waste treatment in mind, the potential impact of enabling free movement of waste in the internal market should be looked into.
- **Implementation of a strict landfill ban on recyclable waste across EU member states is the first important step towards a circular economy.** Higher recoverability and recycling would automatically result. Some lawful practices in member states such as deposition in gravel pits prevents recycling of a higher standard.
- **Strictly implement the five-step waste hierarchy.**
- Lack of information about the quality of recycled material is equally a barrier. **Creating standards (ISO / CEN) on specific, application-based secondary raw material streams would be useful.** Recyclers would benefit from deeper knowledge about the composition of material composites and better target this specific waste stream. With this modular approach, specific non-toxic circularity for specific secondary raw material streams would be created. Especially secondary plastic is not readily available as uncertainties about contents of hazardous substances or other product properties that could impact functionality persist.
- **Engineering industry needs high quality materials**. Hence reliable information on the composition of secondary raw material needs to be available when re-entering the value chain. Manufacturers hesitate to use secondary raw materials if their substance composition is not clarified. At the same time, REACh compliance must be ensured for secondary raw materials in order to guarantee a maximum of environmental protection and health and safety standards. **Developing further technical end-of waste criteria of different material streams (e.g. plastics) offers one solution**. Additional practical solutions have to be further elaborated to lower the hurdle for the use of recycled materials in the high-tech engineering sector.
- **For hazardous substances specific requirements and regulatory measures are already sufficiently foreseen** to ensure safe use along the whole value chain including the re-entering of recycled materials on the European market. New targets deriving from “Circular Economy” should not go beyond REACH legislation by requesting hazard based regulation of chemical substances. Restrictions on substances of very high concern (SVHC), and requirements to provide information on SVHC content should not be further extended or transferred to other EU product legislation but tackled within the existing framework for substance policy; e.g. **if Ecodesign analysis comes to the conclusion that there are significant environmental impacts stemming from a hazardous substance this should be tackled via REACh.**
- **Recyclability of a material should be included in the socio- economic considerations** when assessing the conflicts with other legislation, conflicting EU goals and impact of authorization on society and economy.
- The “repair as produced”-principle embedded in RoHs should be extended to other environmental legislation, considering limited environmental negative impacts while enhancing the lifetime of products.

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