CIRCULAR ECONOMY OPPORTUNITIES FOR DIGITAL PRODUCTS

INTRODUCTION

We welcome the contribution from Digital Europe to the debate regarding the Circular Economy and the Digital Industry, as presented in their paper "The Contribution of the Digital Industry in a Circular Economy" in May 2017. We are glad to see examples of various ways in which the digital industry attempts to advance the Circular Economy. However, we would like to complement this paper with additional perspectives, and challenge Digital Europe's conclusions with regard to policy options.

I. DISCUSSION OF CURRENT CIRCULAR ECONOMY PRACTICES IN THE DIGITAL INDUSTRY

Digital Europe's description of the current contribution of the digital industry to repair, remanufacturing and refurbishment begs some comments. Below, some of their statements are discussed following the same structure as Digital Europe's paper.

01 LET'S TALK ABOUT FIGURES

In their paper, Digital Europe state that 118 000 tons of ICT was shipped for repair and reuse at worldwide level in 2014, out of which 28 000 tons in Europe. While these numbers may seem impressive, they are quite insignificant when compared to the number of products placed on the market and the amount of waste generated both at global and EU level.

In their global monitoring, United Nation University state that in 2014, 3 million tons of small ICT waste was generated globally as well as 6,3 million tons of waste displays (p24/25). If we accept the sum of both as a proxy for digital industry waste, repair and reuse represent but a mere 1,25% of the total volume.

At a European level, the proportion of repair and reuse is only slightly higher. The amount of EEE category 3 IT and telecommunications equipment placed on the market in 2014 totaled over 1,27 million tons. In that same year, 621 210 tons of waste was collected for category 3 IT and telecommunication equipment. In other words, the 28 000 tons shipped for reuse or repair represent respectively 2,2% of ICT placed on the market, and 4,5% of the e-waste collected.[1]

[1] The above numbers do not include the television sets placed on the market and discarded, as they are not counted in category 3 IT equipment. Given that these should be added to the total amounts of product placement and waste, the actual proportion of repair and reuse is lower than the above-mentioned 2,2% and 4,5%. It should also be noted that the weight stated by Digital Europe includes spare parts whereas these are not included in UNU global calculations and Eurostat data.

02 STRATEGIES FOR DURABILITY

Several practices for ensuring the longevity of products are listed in Digital Europe's paper, suggesting that such strategies generally put the sector on a path towards increasing product lifetimes, thereby decreasing the material footprint associated with the equipment.

In reality however, in spite of ever continuing technological progress, no increase in lifetime of ICT products can be observed – quite the opposite seems to be the case. In a recent position paper, the German Environment Agency UBA concluded that the service lives of many electrical and electronic appliances are getting ever shorter[2], and it's not without reason that the European Commission has decided to prepare an independent testing programme to help the identification of issues related to possible planned obsolescence.[3]

Water proofing is quoted as a first example of a way in which the industry ensures that products such as smartphones will be needing less repair. While reducing the potential for failure due to water ingress can be a valid element in a strategy to ensure longevity, it is quite unfortunate that the means currently used to achieve this goal tend to have quite adverse consequences for reparability. Whereas rubber seals have been used effectively in the past to ensure a water-tight construction of all sorts of products, including smartphones, the current industry trend is towards and increasing use of adhesives – and not only in areas where this will help ensure water resistance. The use of strong adhesives as a means of assembly greatly increases the difficulty of opening devices and replacing components, rendering some products practically unrepairable.

For example, for an increasing number of battery-operated devices such as smartphones, tablets and notebooks, it is impossible to simply change the battery. This means that in practice, the lifetime of the product is limited to that of the battery, the performance of which inevitably degrades over time. Furthermore, in their draft analysis about potential resources savings options for computers, the JRC noted that while a standard exists to assess battery durability, this is not systematically used yet. They also point towards a potential for increasing battery life through simple software limiting the state of charge during stationary use of the device. These simple examples related to a single typical component, the battery, clearly show that all possible efforts are not yet made in order to ensure optimum durability of ICT products.

[2] UBA, ***Strategies against obsolescence. Ensuring a minimum product lifetime and improving product service life as well as consumer information*** (May 2017), p. 2. Relatively little research has been conducted on the lifespan evolution of ICT products, but most reports seem to point to a decreasing lifetime. References to various data sources can be found in ***Prakash e.a., Einfluss der Nutzungsdauer von Produkten auf ihre Umweltwirkung: Schaffung einer Informationsgrundlage und Entwicklung von Strategien gegen „Obsoleszenz" (UBA Texte 11/2016)***. A decrease as sharp as -20% in 5 years has been observed for small electronic products ***(Wang, F., Huisman, J., Stevels, A., Baldé, C.P., 2013. Enhancing E-waste estimates: improving data quality by multivariate inputeoutput analysis. Waste Management 33 (11), 2397-2407)***. We are not aware of any studies pointing to an increasing life span of electronic goods.

[3] ***Communication from the Commission to the European parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Closing the loop - An EU action plan for the Circular Economy (Brussels, 2015)***, p. 8.

It should be noted in passing that the JRC report also mentions a set of inspiring standards to certify the durability and resistance of components and materials, that could be used more, eventually leading to a EU binding standard.

As a second example of a practice aimed at achieving longer lifetimes, Digital Europe mention integrated design. As the motivations underpinning design choices cannot be assessed objectively by outsiders, it is convenient to ascribe them to only the noblest of intentions, even if they may be driven by other considerations - such as cost efficiency for instance.

What can in any case be assessed objectively is the fact that increased levels of integration often lead to limited options for repair. Embedding more components or functions in a single part makes the part in question more complex and expensive. A failure affecting one of the components therefore requires either the replacement of a more expensive part or the repair of the part itself, which is subject to much higher requirements than simply exchanging parts and requires information such as circuit diagrams, to which access is commonly restricted by manufacturers. This situation severely limits the range of economically feasible repair options available to the consumer and may lead to early economic obsolescence of products.[4] In order to mitigate the effects of highly integrated design on reparability, manufacturers should make available to all repair stakeholders, all individual components of integrated parts as well as detailed specifications and circuit diagrams as needed to repair these integrated parts.

While Digital Europe's claim, that software updates can help extending life time of devices by limiting the need to change them to access latest innovations, may not be entirely unfounded, it is quite clear that the consequences of current software updating cycles are not exclusively beneficial. The other side of the coin is that all too often, consumers are forced to discard their devices as the latest software or applications cannot be run on them or data security cannot be ensured. It would be unfair to turn a blind eye to the common issue of incompatibility of existing hardware with new software or new versions of the operating system, a form of obsolescence that is typical to the ICT sector.[5]

[4] In a recent report by the German Environment Agency UBA, ***Strategies against obsolescence. Ensuring a minimum product lifetime and improving product service life as well as consumer information*** (May 2017), several types of obsolescence are addressed. Economic obsolescence is described as the situation where a repair is not carried out because the gap between the repair cost and the cost of a new item is too small.

[5] In the abovementioned UBA report Strategies against obsolescence, functional obsolescence is described as a lack of interoperability of software and hardware.

And while Digital Europe point out that cloud services may replace the need for local storage capacity, this solution appears relevant only if it ensures longer compatibility of hardware with evolving storage needs, and is supported by evidence showing that it actually saves energy and resources instead of merely displacing the problem (as the cloud services themselves have a significant and continually increasing footprint both in energy and resources[6]).

In any case, regardless of any trends in the lifetime of electronic products which are often perceived as controversial, it is beyond any doubt that the current life span of electronic products is vastly inferior to what would be optimal from a resource and energy efficiency point of view. In the Öko-Institut's study on timely replacement of notebooks, it is assessed than even with a 20% energy efficiency improvement rate from one model to the next, the service life of a notebook needed to offset the embedded CO_2 equivalent is at least 17 years and most likely 40 years or more. Clearly, we still have a very long way to go to reach an optimum level of longevity.

03 REUSE

Digital Europe refer to a report predicting that at a global level, 120 million smartphones would be re-sold or traded by consumers in 2016, directly reaching a 17 € billion market. It is worth putting this in the perspective of the nearly 1.5 billion units sold to end users in 2016. Clearly, in spite of its growth, the reuse market still far from outweighs new products sales. Moreover, it has been noted that these reused phones generally do not replace new purchases but mainly increase the volume of the market,[7] as is also likely to be the case with the often cited example of phones passed on to a family member of friend.

Questions with regard to reliability, confidence, access to latest functionalities and applications together with fashion are still existing barriers to a higher uptake of second hand smartphones as an alternative for a new model, which would be required to create a truly circular economy instead of a linear one which is merely cascading. Working to remove these barriers remains, at least for a large part, a policy challenge.

While referring to the B2B market of servers and storage equipment, which may indeed reach fairly high reuse rates, Digital Europe neglect the still largely untapped potential for B2C market reuse, which could notably be unleashed through promoting certification for second hand goods, incentivizing leasing schemes and especially ensuring better upgradability of hardware.

[6] A study conducted by Huawei estimates current electricity use of data centers alone (not including internet traffic or manufacturing footprint of data center infrastructure) at ca. 500 TWh or 2% of global electricity demand, and expects them to use up to 13% by 2030 ***(Anders S. G. Andrae, Tomas Edler, On Global Electricity Usage of Communication Technology: Trends to 2030, in Challenges 2015, 6, 117-157)***. According to a recent (January 2017) Greenpeace report, The transition to the cloud could in fact increase the demand for coal and other fossil fuels despite significant gains in energy efficiency and adoption of a commitment to 100% renewable energy because of the dramatic growth in new data center construction by cloud and colocation companies (***Clicking Clean: Who is Winning the Race to Build A Green Internet?***).

[7] ***Trevor Zink & Roland Geyer, Circular Economy Rebound, Journal of Industrial Ecology 21/3 (June 2017) 593-602***, p. 594.

04 PREPARATION FOR REUSE

On the subject of preparation for reuse, the Digital Europe paper only discusses formalities, namely the distinction between reuse and preparation for reuse (indeed the latter implies that the product had a waste status before being prepared for reuse). The essence of the matter is not discussed and most notably, the paper fails to address the largely untapped potential of this specific activity.

Indeed, a significant part of the electric and electronic products that we throw away is still reusable but far too little is actually reused. A research led by WRAP indicated that 23% of the waste electric and electronic equipment (WEEE) separately collected at household waste collection sites could be reused with a small amount of repair.[8] This proportion is even bigger for WEEE collected from certain sources: Le Club Green IT estimated that, in France, 80% of thrown away office ICT equipment could be re-used.[9] It also estimated that 1500 jobs could be created in France, 6 billion liters of water would be saved and the release of 810 000 tons of greenhouse gases would be prevented, if 60% of the ICT equipment thrown away in France by 40 of the most important French companies (CAC40), were to be reused.

Regrettably, it is assessed that at EU level, only a minor part of WEEE is properly collected, and there is no systematic screening of what could be repaired or directly reused from what is properly collected. For these reasons, it is important to keep ambitious policies in the WEEE directive, which, in 2012, has set an ambitious collection target for collection, and prior access to reuse and repair centers has been granted to extract materials worth repairing.

Experience has proven that when preparation for reuse actors are integrated in producer responsibility schemes, more products can be properly prepared for reuse[10]. This can be driven by setting specific targets for preparation for re-use at national or regional level. Recently, targets for the preparing for re-use of WEEE are even set in Spain[11] and in Wallonia[12] with the objective to create and support local jobs. It is through sound policy setting and combining the strengths and competencies of different actors along the supply chain that such opportunities can be grasped. Such an integrated perspective on the reverse supply chain may not emerge spontaneously.

[8] WRAP, The value of re-using household waste electrical and electronic equipment, 2011

[9] Le Club GreenIT, Réemploi Et si le CAC 40 reconditionnait 60 % de ses ordinateurs ?, 2016

[10] ***RREUSE, role of Extended Producer Responsibility in promoting product reuse and preparation for reuse activities, 2013***

[11] ***RREUSE, Spain first country to set target to stop reusable goods ending up in landfill, 2016***

[12] ***RREUSE, Belgian region sets re-use target for electricals, 2017***

05 GUARANTEES

Digital Europe claim that "Member States have adopted legal guarantee regimes of minimum 2 years, which covers any defect that is presumed to have existed at the time of the delivery of the product and that becomes apparent within the guarantee period". What is not mentioned here is the fact that the burden of proof regarding the existence of the defect at the time of sale, is usually shifted towards the consumer after 6 months. In other words, if a failure occurs after 6 months it is up to the user to prove that the default stems from flawed design or manufacturing quality. Due to the technical complexity of ICT and electronic devices, this is hardly feasible for a consumer. Offering a voluntary commercial warranty at an additional cost may not be the solution to solve this fundamental issue.

06 REPAIR

Digital Europe adopt a very restrictive point of view when stating that in the circular economy debate, repair is mainly discussed in terms of repair cafés, do-it-yourself (DIY) and similar small-scale activities, which they put in contrast with large-scale repair networks managed by the manufacturers.

Indeed grassroots initiatives are often mentioned in a circular economy context to showcase possible action for individual consumers and as part of the narrative to promote more circular consumption patterns. That being said, structured networks of repair organizations independent from manufacturers have existed for a long time, both in the social and regular economy, and going much beyond DIY. However this sector has increasingly suffered from the prevalence of products that are designed to be unrepairable with the simple means that used to suffice in the past, and from difficulties in obtaining the necessary spare parts and information.

While repair centers organized or certified by manufacturers certainly have a role to play, the example of the automotive industry, with manufacturers required to make spare parts and information available to independent repairers whilst also offering certified repair services, show that the two systems should not be opposed. In this context, we would like to refer to the arguments of Free ICT Europe and RREUSE on the matter.

While Digital Europe present manufacturer-controlled repair infrastructure as the preferred way to „offer superior repair services at competitive prices", it seems clear that the repair solutions currently offered by manufacturers do not fulfill all of the customers' needs. Experience shows that in many cases, a cost-effective repair solution is not available and retail stores routinely orient consumers towards the purchase of a new product instead. In fact, if repair cafes have mushroomed globally, with well over a thousand local organizations active just a few years after the first repair café was organized,[13] it is precisely because they address this market failure: a lack of economically viable repair options for faulty products which consumers do not wish to discard.

Since manufacturers may have higher incentives for selling new products than for repairing existing products, one cannot be sure that the industry, left to its own devices, will evolve towards repair solutions that are in all respects competitive with a new purchase. Regulation may well be needed to make sure sustainable options are available to the customer and to reward those manufacturers that are already taking a lead in providing those.

We also believe that there is still quite some work to do in assessing and rating the repair services that are offered by manufacturers as well as other parties. This will require the involvement of various stakeholders and proper policy setting if EU is to rely on more systematic and affordable repair services.

07 REMANUFACTURING AND REFURBISHMENT

We cannot agree more with Digital Europe when they state that refurbishment and remanufacturing have the potential to create jobs and save on greenhouse gas emissions. For this reason, it is again important to see the current remanufacturing activities in the perspective of the total market and note the vast potential that is currently unused.

While Bitkom estimates the ICT remanufacturing industry turnover in Europe at 6.9 billion dollar, this pales in comparison to the total revenue from the digital ICT market in Europe, estimated at 944 billion euro for 2013 by Statista.[14] With around 0,5% of remanufacturing only, it is worth asking why these activities which are considered to be so promising, are not extended more broadly. Sadly, Digital Europe's paper does not indicate any strategies to unleash further potential.

The same European Remanufacturing Network (ERN) referred to by Digital Europe, state as a conclusion of a report showcasing remanufacturing case studies:

[13] ***Repair Café jaarverslag 2016***, p. 21.

[14] Statista, ***Revenue from the digital ICT market in Europe from 2012 to 2019***.

"In particular the work illustrates a broad lack of activity within DfRem despite widespread calls for more activity within design to support remanufacturers. (...) Moreover, the role of design strategy in successfully bringing remanufactured goods to market is largely overlooked. (...) In addition, the remanufacturing sector is largely represented by independent remanufacturers, who have no control over product design. In other cases remanufacturing is a peripheral business activity and because of this its potential may not be fully explored or innovation in remanufacturing is not invested in. This highlights the interdependency between the business model and the design of the products which remanufacturing companies bring to market. This lack of investment in design, limits the potential for remanufacturing in the long-term".

II. PRINCIPLES FOR LEGISLATING CE AND THE IT INDUSTRY

In the last part of their paper, Digital Europe list a set of recommendations which in fact come down to avoiding any policy measures at a European level, as if the mere exposure of some good examples is sufficient proof that the industry is on the right track and will spontaneously ensure a proper transition to a circular economy and capture its full potentials. We would like to challenge this naive perspective.

A Not using the waste legislation to address repair, refurbishment and remanufacturing might simply be a missed opportunity: Spain has set an example by setting WEEE preparation for reuse targets (3% of ICT equipment by 2017), the EU moves towards targets for Municipal solid waste preparation for reuse in the context of revising waste policy in 2016/2017, and some producer responsibility schemes already have preparation for reuse targets, paving the way for broader and possible systematic application at European level. The question should not be about what not to do, but about what best to do through waste legislation.

B We would prefer to not just recognize the potential for reuse, repair, remanufacture in the digital industry, but rather boost it in order to increase the insignificant proportion of the ICT market that it currently represents. This can be done through:

- clear legal drivers that will secure investments and create level playing field for competition;
- design requirements as recognized necessary by the remanufacturing and repair industry;
- defining economic incentives through EPR schemes, or VAT[15].

Information schemes and repair service rating systems could be created to nudge consumers towards more circular products. In addition, independent repair businesses should not be discriminated by manufacturers or hampered by product designs requiring proprietary tools to disassemble products, but rather enabled to offer premium quality services by unrestricted access to repair information and spare parts. The automotive sector sets a precious precedent to grasp the potential benefits of repair by requiring manufacturers to make parts and repair information available also to independent companies.

Furthermore, the intellectual property argument should be respected, but not overstated. Being able to change a battery or to extract key components after failures does not in any way pose a threat to intellectual property, and neither is it stifling innovation. A stepped structure of repair operations could be defined, from the very basic ones possibly performed by consumers, to the more technical ones to be undertaken by repair companies, eventually leaving only the few very critical ones affecting intellectual property to manufacturers and certified repairers.

Intellectual property protection should not be overused as an argument to create barriers to new entrants on the market and sound competition that will benefit both consumers and society at large.

Finally, if manufacturers wish to keep the whole control over their materials, nothing prevents them from adopting servitizing business models, such as leasing, thus remaining owners of the materials they propose to end users.

C We find the suggestion by Digital Europe that serious investigations are not made when design and information requirements are proposed for material efficiency, to be offensive to the Ecodesign community. We would like to highlight the extreme attention paid by the JRC and other consultancy companies in charge of preparatory studies with regards to the proposed measures, notably integrating the possibility to measure, report and verify performances and information requirements.

More fundamentally, we would like to question whether the burden of proof should be on policy makers and not on the industry when it comes to making sound proposals for the benefit of society, with regard to information and material efficiency requirements.

[15] ***RREUSE, Reduced taxation to support re-use and repair, 2017***

C2 While Digital Europe suggest that manufacturers are in the best position to decide on trade-offs between design features, experience shows that they do not always have the right incentives to choose those options that are most beneficial to society. It might be time to stop considering the status quo as the default option. We suggest reversing the burden of proof in order to make the circular option favoring reuse, repair and refurbishment the default option, to be departed from only if enough evidence is provided by industry that it is not technically and economically feasible.

It is worth reminding that in two consecutive evaluations of ecodesign policy made in 2012 and 2014, the conclusion has been that requirements either didn't show sufficient ambition or were set at the right level - never too high[16]. Nonetheless all stakeholders involved in ecodesign policy know that the industry systematically challenged these proposals as being too ambitious. Notably the iconic measure blamed for being much too low in ambition in both policy reviews, is the implementing measure for televisions - which happens to have been heavily influenced by Digital Europe.

D The "Repaired as produced" principle is a sound principle which can be applied for existing spare spart stocks and even for newly produced spare parts insofar as no valid substitute exists for the hazardous materials embedded in spare parts. However, where technically and economically feasible options for substitution are clearly available, it makes no sense to impede the detoxification of materials and create a further burden for the whole economy by extending the legacy of hazardous substances. We think a case-by-case approach is to be considered to incentivize detoxification where possible.

Furthermore, we suggest drawing a clear legal line between repair or refurbishment on the one hand and remanufacturing on the other, in order to limit misinterpretations and uncertainties. Where a product is repaired or refurbished and placed on the market as a second hand product, the "repaired as produced" principle may apply if no valid substitute exists. But where a product is remanufactured and placed on the market as a new product, the "repaired as produced" principle should not be applicable.

[16] The 2012 CSES study can be found at: *http://ec.europa.eu/smart-regulation/evaluation/search/download.do;jsessionid=Xsj8RodUb9p9C8bLidTO3m64uBmXJ0VY-fA9bvU7oDTxQpMpnajH!781246111?documentId=1228634*

the 2014 Ecofys study can be found at: *http://www.energylabelevaluation.eu/tmce/Final_technical_report-Evaluation_ELD_ED_June_2014.pdf*

E As far as consumer policy is concerned, Digital Europe's recommendation comes down to simply preserving a policy that has obviously become obsolete. It should be noted that in 2016/2017, the European Union is already revising the consumer policy to better address online sales.

On the contrary, we believe it is worthwhile to consider new policy options to better protect consumers' interests:

- Set longer legal guarantee periods to better match the lifetime expectancy of products, with repair being offered as a priority option versus replacing the faulty product. A TV or a computer should not be only covered for 2 years when their expected life time is 5 years or more;
- As far as causes of failure are concerned, keep the burden of proof with the manufacture during the whole period of the legal guarantee. It should not be up the consumer, who obviously lacks the expertise to do so, to justify that a failure is linked to a design or manufacturing flaw, but rather up to the industry to justify any objections to a consumer's warranty claim;
- Consider requiring the systematic display of the free warranty period during which the manufacturer assumes the full burden of proof, as it exists in car industry. This would create a new competition field and enable producers to differentiate.

It should be noted that Digital Europe's arguments for preserving the status quo, referring to sufficient protection being already in place and expected negative effects of policy revision, are completely undocumented and rather arbitrary – much more so than the ecodesign measures which they criticize as not having been thoroughly studied (cf. supra). We would welcome any research-based evidence to support Digital Europe's claims about the impacts of revised warranty policy.

Digital Europe's plea to „not revise EU law so that consumer (rather than then the trader) is allowed to choose the remedy" is somewhat surprising, since current law already gives the consumer freedom of choice between repair and replacement.[17] However we agree with Digital Europe that such freedom of choice may lead to unnecessary replacements with adverse consequences, and we would support legislation giving priority to repair in line with the waste hierarchy.

[17] ***Directive 1999/44/EC of the European Parliament and of the Council of 25 May 1999 on certain aspects of the sale of consumer goods and associated guarantees***,
Art. 3, §1: "In the first place, the consumer may require the seller to repair the goods or he may require the seller to replace them, in either case free of charge, unless this is impossible or disproportionate."

F Digital Europe finally call for more lenient rules when it comes to waste shipment to allow more shipments for repair and refurbishment. Some provisions have been set in the 2012 WEEE Directive allowing some B2B products of critical interest to be shipped for repair under certain conditions. This has already worried experts of transboundary shipments, as creating a possible loophole to export waste. The suspicion with regards shipments of non functional WEEE could be partially mitigated if clear certification schemes with third party verification were set up in order to ship faulty equipment only to authorised facilities, reassuring national authorities and surveillance bodies about the fate of shipped products.

In their ultimate argument, Digital Europe bring forward the overused argument of administrative burden linked to waste shipment. We would like decision makers to adopt a broader view on this: this administrative burden does not only concern manufacturers, but also national authorities in charge of surveillance and enforcement, repairers and other economic actors along the reverse supply chain in search for trustful information, and finally citizens eventually paying the consequences of mismanaged waste shipments. The manufacturers' narrow perspective on administrative burden affecting them does not reflect a balanced picture.

CONCLUSION

While we are convinced that the digital industry can help make progress and accelerate the transition to a Circular Economy, examples of best practices do not provide sufficient proof of a positive evolution, especially in the light of current trends in product design and lifespan. We cannot trust a bright new future to spontaneously emerge from the status quo. Clear legal targets and incentives should be put in place to guide the industry on its path to circularity.

In order to help the digital industry evolve in fair conditions, a respectful dialogue with all concerned stakeholders is needed to make sure ecodesign, waste and consumer policies are used to their full potential and a balance is found between legal drivers, economic incentives and information schemes. As a first and concrete action, we strongly recommend to include smartphones, as an iconic ICT product, in the ecodesign work plan to enable detailed investigation, knowledge acquisition and sharing, and proper discussion among all stakeholders.