Ecodesign preparatory study on mobile phones, smartphones and tablets

Final Stakeholder Meeting

Venue: **Webex**, access details sent through e-mail

Date: December 18, 2020 (9.00 a.m. – 4.30 p.m.)

Minutes

Participants:

- Study team:
    - Karsten Schischke, Fraunhofer IZM
    - Anton Berwald, Fraunhofer IZM
    - Christian Clemm, Fraunhofer IZM
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    - Marina Proske, Fraunhofer IZM
    - Antoine Durand, Fraunhofer ISI
- European Commission, DG GROW:
    - Davide Polverini
- Organisations represented by registered Stakeholders for the meeting:
    - ANEC
    - Apple
    - BAM
    - Belgium Ministry of Environment
    - BEUC
    - Bundesanstalt für Materialforschung und -prüfung (BAM)
    - Cefic
    - CLASP
    - CMS
    - Deutsche Telekom AG
    - DIGITALEUROPE
    - EEB
    - ECOS
    - Energy Authority of Finland
    - European Commission
    - FEICA
    - Free ICT Europe Foundation
    - General council for environment and sustainable development, Ministry for ecological transition, France
    - General Directorate for Energy and Climate Change (FR)

- German Federal Ministry for Economical Affairs and Energy
- Google LLC
- Hanover Communications
- Heise Medien
- Huawei
- iFixit
- Industrieverband Klebstoffe
- LG Electronics
- Malta Competition and Consumer Affairs Authority
- Nesta
- Netherlands Enterprise Agency
- Norwegian Water Resources and Energy Directorate
- Öko-Institut e.V.
- Panasonic
- Samsung Electronics Nordic AB
- SHIFT GMbH
- SIMPPLE
- Swedish Energy Agency
- Telefónica
- tesa SE
- The Finnish Energy Authority
- The Norwegian Water Resources and Energy Directorate
- The Restart Project - European Right to Repair Campaign
- UBA
- Umweltbundesamt
- University of West Attica
- Vangerow GmbH
- Verbraucherzentrale Bundesverband (VZBV)
- Viegand Maagøe
- Vodafone
- Xiaomi Corporation
- Xiaomi Technology

Task 1

- **Apple**: when can we expect a mandate for product group specific standardisation?
- **Belgian Ministry of Environment (BE)**:I hope this standardisation request should be on reliability and reparability ? So we can have a durability label somewhere in the future ?
- **Apple**: My take was that the request should cover all Product material efficiency aspects that will be covered in the upcoming regulation and apply them to this product group. And we need it really soon, otherwise we will not have enough time to develop the needed test methodologies.
  - **D. Polverini**: Indeed, we know that the preparation of the standards requires certain time. So to the extend of the analysis we are carrying out right now, what we are doing is: To see if, to the extent of the parameters identified, if there are already available existing standards and/ or methodologies not necessarily embodied in international or EU standards which could be used. As usual, the ideal mean for us is

for having a calculation method is standards. So indeed working on the standardisation mandate is one of the current activities. I don't have already a clear timeline because, again, for that kind of immediate use we should either refer to existing standards which need to be finalized or which are already available. You may have seen that in the latest approved so called omnibus regulation, which has been finalized in November, as a kind of procedural novelty we have included for 2 regulations, which are displays and servers, in the annex also called draft transitional methods, which can be used for assessment of compliance of the paramenters until harmonized standards are in place. I would use a similar approach in case of smartphones given the timeline.

- **Apple:** I am aware of the approach for lot 5, and the issue that we are having there is that once the transitional method has been established and then even if the standard comes later there is room to actually deviate from it, instead of having a standard which is fully developed with the industry. We concluded in the lot 5 process that it is important to have a mandate for a standard quite early so that standardisation organizations can actually properly participate in the process, if it's supposed to work.
  - **D. Polverini**: I don't have an exact timing in mind right now for the standardization mandate for this product group. It's not an immediate action item. The specific reason is, that when issuing a standardsation request, we must have clearly in mind what are the requirements to be proposed. Normally, standardisation request are issued once the regulation is published in the official journal. Obviously, we would like to go a bit ahead but at least we must have a more finalized view on what will be the requirements. We are just seeing the conclusion today for the first time. If we launch the request, it would be on all classes of requirements which has been proposed in the task 6, but obviously it will be some waste of work if some of them are not then becoming the actual requirements. The standardisation work will be a parallel work to legislative developments. In the absence of standards we would make use of existing methods.

Task 2

No questions

Task 3

- **Öko-Institut**: Eurobarometer 2020 survey: Does the survey cover information on the (average age of digital devices at the time of replacement, differentiated according to the reason of replacement (device broke down, performance deteoriated etc.)?
  - **Fraunhofer:** Unfortunately this kind of data is not given in the Eurobarometer 2020 survey. Otherwise it would have made into the task report. Indeed, this would be very interesting correlation, to know which reasons to discontinue the use of devices occur.

- **Öko-Institut**: Slide 30, Battery Health: Did I understand correctly that the data is related to only one OEM? This is probably a high-end model, right? Could you estimate if comparable battery health is achieved by other high-end models as well? What is the market share of these high-end models in the EU?

- o **Fraunhofer**: Correct, this is only for one OEM. The market share is approximately 25 % in the EU ± 5 %. I would say yes, it is high-end devices therefore it can be assumed that the battery is as of higher quality than the average market, comparable to the battery health achieved by other high-end models. But we do not have data on that. So this is hard to answer.

- **DTAG**: That spread [referring to battery lifetime data presented] reflects differences in power management of individual device types.
  - o **Fraunhofer:** Confirmed.

Task 4

- **ECOS**: On technologies: the shift towards wireless smartphone charging and the lower efficiencies of this charging technology plus need for standardised test methodologies and to work towards improved efficiencies was not addressed in the previously distributed task 4 report - has this been addressed in revisions?
  - o **Fraunhofer**: Not yet. There is not very solid data out there. We ourselves made some investigations on wireless charging technology and how this impacts the efficiency of the devices. But it's getting tricky here because it's a question of how the wireless charger communicate with the end device and more specifically how the devices are aligned. There are numerous system parameters which are not all under the control of the end device. The energy efficiency of wireless charging differs . It's not necessarily the case that wireless charging is significantly less energy efficient than wireless charging. We also have examples where there is obviously a very good match between end device and wireless charging pads. With very good technologies on both sides you can achieve highly energy efficient charging. We are running another study for the European Commission on wireless charging to have a look into that. Currently it's less on the energy efficiency aspect, more on the compatibility aspect and which devices are compatible with technology shifts in the market. So if you are interested to get involved in this one, just approach us and we will put you in contact with this study. But here in the task 4 report it's not assessed in detail. As of now we can't really draw the right conclusions yet in terms of design options and what should be the measure to address wireless charging. So if there is any kind of evidence out there from your side to assess it properly, your input is much appreciated.
- **Belgian Ministry of Environment:** Would wireless charging be covered in the EPS revision? And what is the link with the 'common charger initiative' ? Should this also be covered in the upcoming EPS review?
  - o **D. Polverini:** There is ongoing work from the Commission side also on these two aspects as mentioned before, on wireless charging and the common charging initiative. I did not include these two studies in the introduction but they are also parts on the initiatives related or in parallel with these studies. The common charger initiative is led by DG GROW. What we have done here is assessing the effect in environmental terms of solutions linked to products with and without the charger.

We will then reflect on potential requirements. Obviously, we will coordinate an approach without any overlaps with the common charger initiative.

- **ECOS:** The slide on OS security support shows a wide range of number of years of security update support, with some products having support for three to six years. The design option evaluated was for 5 years OS support, yet the policy proposal in task 7 is for only two years OS support, which seems surprisingly unambitious - perhaps this can be explained?
  - **Fraunhofer:** There's pretty long operation system support available from those large OEMs with their own full control over their OS. With Android it's somewhat different because they relatively depend on a third party. The question is how to force the third party to support better what is going on with the end device. An ambitious OS support duration depends on several players, not only the OEM. Making best in class the benchmark for everyone poses a risk to many OEMs how to fulfil such requirements as it is not fully in their hands. This might then require that everyone has to develop their own operating system to be on the safe side. You can't rely on others. That's the reason, why we have been rather cautious with a minimum requirement of two years only, which can be achieved by all and cuts off the worst cases shown on the other slide. It can be argued that it should be more ambitious because in theory it's possible to be more ambitious on this point. Another aspect is the balance of measures in task 7, where we are talking about spare parts availability and it would not make sense to have an extremely long spare parts availability if the operating system is not supported much shorter. We will come back to that on task 7.
- **ECOS:** I find it is quite disappointing to already be accepting business as usual in the policy options that have been proposed. I think it makes more sense to create the requirement that we were aiming at and where we would like to see transformation in the market. Framing an ambitious requirement is the way to create a change. The idea of eco-design measures is, there is a level of change and of market transformation. So requiring business as usual at this stage of a preparatory study doesn't seems to align with what we are trying to do here in policy terms. I would encourage the contractors to be more ambitious and not to worry too much about how exactly this is reached, because now is the time to be ambitious and for actual changes.
- **Öko-Institut:** OS support: While we understand the problem of third party software developers/ third party OS support, 2 years as minimum requirement for OS support is considered to be too low in task 7. The minimum support requirement shall at least correspond to the same time-period as the availability of other spare parts in order to be consequent in promoting longer lifetimes. So, supporting what ECOS said.
- **Belgian Ministry of Environment**: To have better support of OS, devices should be able to be 'unlocked' so they can be 'rooted' and new OS can be 'flashed'. The Google devices come unlocked, I believe.
  - **Fraunhofer:** On the point rooting of devices: Theoretically this is a good approach to keep devices longer in use but the question is - and I am not aware of any consumer survey on this topic -, how many user would make use of this option? I really assume that most people just would stay with the operating system as it is and would not

make any changes and would not at all be comfortable to change over to another operating system. It is just typical that users in their majority even do not deviate from default settings. Therefore, for the even more complicated issue of rooting devices, I hardly could imagine that this is relevant for, let's say, more than 1% of all users. If this is true it wouldn't make significant changes to the market even as a mandatory requirement. But if you are aware of other insights, if you are aware of huge market interest from the consumer side to be able to root devices, this would change the analysis at this point.

- **Restart:** It's unlikely you can find data on interest in rooting phones and using alternative OSes - particularly because this practice is extremely hard. If barriers were removed, it would be of greater interest.
- **CLASP:** I agree with Restart - you can't assess the interest of consumers in a practice that they barely can consider as an option (and mostly are not even aware of)

- **iFixit**: Has the role of software on repair been addressed? Increasingly, parts need to be paired to the motherboard or controller in order to function. Access to the pairing interface is often restricted to the manufacturer's authorized repair providers, making it impossible for small repairers, non-profit repair initiatives and similar repair actors to replace such parts.
  o **Fraunhofer:** No, it has not been addressed yet. For one methodological reason, I would say. The preparatory study looked pretty much from state of art towards the better option and it's a bit blind from the methodological point of view to look what are the worst practices in place. We are aware that this point has been raised before, but for us it is also difficult to take this into account, as long as we don't have further facts on this. So therefore we would have appreciated any substantial input on this matter beforehand. But the door is not closed yet. Provide further facts on that aspect, we invite you to do so. We will take this then into account. When we take this on board, then OEMs for example should also be aware that this will be an issue in the report, so you might share your views proactively. What are good reasons maybe to implement serialization and to restrict some repair or to design repair processes in a way that you have to go through certain procedures to make it work, which might limit the ability for repair for others.
- **EEB:** Ignoring the issue of serializations could make the repair provisions largely ineffective...
  o **Fraunhofer**: That's why I asked to provide further input and evidence for those who are in the repair business to describe this problem and its extend in the market. On the other hand OEMs should be prepared to respond to this, why certain measures are taken. Then we can address this properly with the update of the study.
- **Belgian Ministry of Environment**: If you would have spare part availability requirements, as we have for existing Ecodesign regulations, serialisation could be seen as non-compliance? If a part made available is not useable to restore functionality, it is not a spare part. The definition used is " 'spare part' means a separate part that can replace a part with the same or similar function in a product;"

- **EEB:** Thanks for your suggestion - either way, from a technical or legal perspective, this [serialization] should be investigated in the study, this is being applied to products on the market right now, and for some time already.
- **Belgian Ministry of Environment:** Serialization means manufacturers should take extra care to whom they supply what exact spare part. And for repairers it means they should be careful what they replace with. It seems like a hurdle for easy repair or reuse of used parts. I suspect it only applies to parts that have some electronics in them, where pairing can be 'coded in'? If the reason for coding is 'warranty' or some other contractual arrangement, it would be good if after the contract expires 'serialization' could be disabled.
- **UBA**: I support ECOS and Öko-Institut in the question of longer OS support. Also software should not hinder repairs (pairing of parts to the motherboard ...).
- **DTAG:** The counter argument from OEMs is cost and the resources needed to keep the software development teams together for longer periods. How to deal with that? 2€ [as stated in the task 6 report for longer software support] can be a lot in competitive markets. I support longer update periods, but we need to convince OEMs.
  - **Fraunhofer:** It is indeed a cost issue, if you need to update software for longer, if you are required to provide spare parts for longer and similar issues. You need to have processes in place for all this and this is a cost issue. Of course by now it is for cost reasons that operating systems support is discontinued at a certain point in time, but just to echo the ECOS comment before: the ecodesign regulation is meant to fix aspects, where the market is acting against the interests of the consumer. Even if it is then more costly for the OEMs, at least with a minimum requirement the playing field is the same for all. So it would not disturb the market in competitive terms unless single vendors go bankrupt, change company names, so they can hide away from such kind of long term requirements.
- **Öko-Institut:** From the perspective of LCC, overall costs for consumers & society are lower, even if there is an increase in the product price. Here, I would like to cite the text of the inception impact assessment of the EU Commission on Sustainable Products Initiative: "Measures to reduce negative effects on climate and the environment related to materials and production may at least in the short term lead to extra costs for producers and/or retailers, which could in turn lead to purchasing price increases for consumers, but the corresponding costs borne by society related to those negative effects is reduced. Economies of scale mean the price difference in the longer term will be smaller as sustainable products become more mainstream and the extra costs are shared out over a larger number of products".
- **DTAG:** Fully agree with Öko-Institut, the impact on the environment is not factored in in most categories of goods. Unfortunately this leads to distortions. Consumers need to be educated that goods tend to become more expensive when those effects are factored in, but which in turn may steer consumption behavior towards more sustainability. There is an analogy to bio food, its higher prices are increasingly accepted by markets.
  - **D. Polverini:** General comment concerning the discussion on stringency and level of ambitiousness of the requirements. In general terms and ecodesign. What we would like to achieve is to foster the evolution of the market, but taking into account the feasibility for all the stakeholders, time to adapt and so on. What has been done in

the analysis was to propose something which takes all these elements into account. Also bear in mind the difficulty of the exercise. Once we have the design options and analysed the life cycle costs than the difficult part of translating design options into actual requirements follows. That is what we actually are describing here. Contributions and comments on these particular aspects from stakeholders are welcome and also if there is a common understanding that it is feasible to propose aspects more stringent like the software issue.

Task 5

- **DTAG**: The market share of foldable devices is low and will not grow substantially due to still high prices.
- **Apple**: 1 full charge cycle per day seems to be based on a pretty heavy use assumption
- **ECOS**: For those smartphones that are not BC3, a charge cycle a day seems reasonable - higher-end phones with improved batteries could be lower in charge cycle frequency, but it sounds like the same usage assumption needs to be applied across all three base cases. Is that correct?
  - o **Fraunhofer:** It is a good question whether this assumption is correct. This has been now our modelling basis and there are valid arguments that are for some high-end devices battery endurance is also significantly better. But use patterns might also be a bit different. There are indications that this kind of charging frequency might overestimate slightly the impacts. I would confirm that. Whether this justifies then to adapt once again the modelling and to refine it further, depends also on the feedback we might get.
- **Apple**: I assumed that different BCs have different use assumptions. It would be hard to argue that all 6 BCs are used with the same intensity.
- **ECOS**: We commend the contractors on their detailed exploration of a wide range of design options and the pragmatic approach they have taken to updating certain aspects of the MEErP approach. A question to the Commission - will the Commission build on this work in revised guidance on the MEERP tool/methodology so that such improvements can be applied in a more consistent way)? For example lifetime modelling, updated factors for societal costs, addition of new materials etc?
  - o **D. Polverini:** Yes, this goes quite naturally. The MEERP review is with JRC and they are informedabout the specific approach which has been used here. Unfortunately, we couldn't do the opposite which would have meant to use the conclusions of the MEERP study here, but in terms of timing they were not matching because the MEERP study will be concluded in the end of 2021 only.

- **Öko-Institut**: Slide 53: Repair Costs Scenario: Would repair costs & purchase costs between different lifetime models be calculated in a comparative way. As a model with short life time needs to be purchased & produced more often than a product with longer life time, it will have overall higher costs & impacts.
  - o **Fraunhofer:** I can just confirm. This will be taken into account later on [in Task 6]. By now, I only talked about individual products and base cases over the whole product lifetime. When you look at our assessments in the later task 6, results typically refer to per year of use. This takes into account that repair cost might be stretched over a

longer period and that the purchase price is then allocated to the various years of use. In essence, this is also taken into account for the lifetime modelling, when we model how the lifetime is extended.

- **ECOS**: The rationale behind the recycling credits shown in the base cases is unclear, considering that recovery/recycling of phones is so low and many of those that are collected leave Europe to be reused in other countries (therefore credit doesn't occur in Europe). There also seemed to be no additional crediting of improved recyclability allocated in the later analysis (task 6&7) to relevant design options such as those that improve repair/disassemblability. Could you please explain?
  - o **Fraunhofer:** First, on the recycling: this is a bit of a problem of how this is displayed. The recycling figures in this assessment tool include reuse. According to our modelling, EoL reuse does not mean the normal handover like eBay or some kind of e-commerce platform in Europe, but reuse outside the EU27, just as devices are collected, then third parties sort what needs to go to recycling and a significant share is meant to go to reuse outside EU27. If this is a legal practice or not is not the issue. It reflects how the market seems to be currently. So this reuse is then allocated in the tool as "recycling credit". This is somehow misleading.

- **ANEC-BEUC**: We find that the data provided on repair costs give the impression that they are lower than what they actually are for individual consumers. In fact, high cost for repairability normally leads consumers to go for product replacements rather than repairs (economic obsolescence). Is this due to methodological problems related to the outdated calculation tool and how do you think to address this issue?

  - o **Fraunhofer**: There are major differences regarding repair costs, among different OEMs. Same is the case for repair shops. We had to come up with a proxy here. We did some desk research about repair costs in task 2, and we then just calculated with these proxies. We also made a plausibility check with aggregated data, comparing the turnover of the repair business for these devices with our figures for products on the EU market market. There is a pretty good match. In that sense, we are rather confident that these estimates are not too far off from the current situation on the market.
- **Öko-Institut**: Base cases 1, 2, 3 show an increasing environmental impact (e.g. GHG emissions) respectively, even though their lifespans vary, with base case 3 having the longest lifespan. Even the environmental impacts per year show that products with a shorter lifespan having lower environmental impacts than products with longer environmental impacts. This gives a skewed picture overall and is in contradiction to many other studies done to measure the environmental benefits of long-lasting products. Could you explain the reason for this? Is it because of the limitations of the EcoReport Tool to evaluate material efficiency aspects, such as modularity, replaceability of key components, repair-friendly design etc.?
  - o **Fraunhofer**: To compare Base Case 1 with Base Case 2 with Base Case 3 is a bit "unfair" as these results highly depend on the different lifetimes assumed for these

Base Cases. The impact of Base Case 3 with the longest lifetime even on a "per year of use" basis is highest due to the significantly higher manufacturing phase impacts compared to the other Base Cases.

- **Öko-Institut**: Actually I was trying to make the point that normally when you compare products with shorter lifetime than longer lifetimes, you compare them to a certain period of time which considers the different lifespans. For example if you have a smartphone with a 2 years lifespan over a period of 5 years then you need 2,5 smartphones. And over the same time period you need less number of products with longer lifespan. If you look at the research, and even though high-end models because of the material requirements and the design requirements probably have higher impacts per lifecycle, overall, their societal and environmental impact is lower because less number of products need to be produced and shipped, etc. So this is something which is not reflected in the methodological approach. I think it is not a problem of the modelling you the tool you use result in some distortion of the real societal costs and impacts of smartphone with short lifespans.
  - **Fraunhofer** (reply rephrased after re-reading the question): You are fully right, the same smartphone used for longer ends up with a lower environmental impact "per year". But the comparison of Base Cases shows something else: A low-end smartphone with a short lifetime of 2,5 years has indeed a lower environmental impact than a high-end device with a 3,5 years lifetime. The additional impact of manufacturing more low-end smartphones over time still in total results in lower environmental impacts. This might be somehow counter-intuitive, but we can confirm that these correlations are apparently correct. With a much higher lifetime difference than 2,5 years vs. 3,5 years the lifetime difference would change the picture, favoring the long-living high-end device.

- **Belgian Ministry of Environment**: On repair costs, where any surveys, catalogue searches or dedicated studies available to underpin cost estimates (spare part purchase and if relevant, paid working hours)?
  - **Fraunhofer:** This was addressed in Task 2, page 77. In Task 2 a data set of purchase prices, battery replacement costs as well as display replacement costs of 52 smartphones from seven different manufacturers was collected from OEM websites and price comparison portals.

- **EEB**: Slide 58 Societal damages: in Task 4 you refer to the use of organophosphate esters as flame retardants or plasticizers (?) in smartphones. It seems these are used more widely than halogenated flame retardants in phones. However, we have seen articles describe these chemicals as regrettable substitutions, due to health concerns at current levels of public exposure. Is this something you investigated further? I did not see toxicity referred to again in the rest of the report chapters. This is an emerging issue.
  - **Fraunhofer:** We have a bit of data on harmful or potentially harmful substances in the report. But it is not addressed in detail, because it is the scope of different legislation to regulate the use of substances and also the environmental assessment of the eco report is not fully appropriate to take this into consideration. You might notice, we have in the environmental assessment also some toxicity aspects related

to emissions. But this stems from the generic environmental assessment background data throughout the lifecycle. This is here not differentiating if one model is build with more e.g. organophosphate or less of that substance. However, on the topic of flame retardants, we had a look into that and try to figure out to which extend at all flame retardants are in use for this kind of devices. It seems to be that there is hardly any use of flame retardants except for power supply. But besides this, so far it seems there is no brominated flame retardants at all. Phosphate based ones might be in small occasional use, but it seems to be not a big issue here.

- **Cefic**: The criteria on hazardous and restricted substances are beyond the scope of the Ecodesign Directive." Please look at REACH or RoHS.
- **EEB**: This is not the experience we have with other product groups, e.g. Lot 5, also see the commitment in the Chemicals Strategy for Sustainability: "The Commission will: minimise the presence of substances of concern in products by introducing requirements, also as part of the Sustainable Product Policy Initiative, giving priority to those product categories that affect vulnerable populations as well as those with the highest potential for circularity, such as textiles, packaging including food packaging, furniture, electronics and ICT, construction and buildings;"
- **DTAG**: However, harmful substances have a major environmental impact when considering holistically the whole supply chain including recycling. Ores to make these substances need to be mined, these then processed to the substances where also harmful byproducts or waste may be formed, the substances then go into components and finally these are assembled to the final device. During recycling the whole sequence is reversed. The risk here is that in any of the steps harmful substances may be released into the environment, particularly if the process is not diligently managed which cannot be guaranteed in every corner of the world. Limiting harmful substances in devices removes the need for the supply chain to processes these harmful substances or their potentially likewise harmful precursors.
- **DTAG**: Organophosphorous compounds are less problematic than halogenated flame retardants.

- **DTAG**: The loss of battery capacity with each cycle is an innate electrochemical property of the electrochemical systems used for rechargeable batteries. A 100.00% reversible system does not exist. So there is an intrinsic battery lifetime given for any of such systems. However, this can be curtailed by quality deficiencies (Li ion battery manufacturing is very sensitive to process control) or inappropriate charging conditions (the larger the voltage window, the more irreversible side-reactions are enforced). So focus should be here on controlling these curtailing factors.

Task 6

- **ECOS**: Explanation of how the lifetime model works is very helpful - please could you include more details on this in the task 6 report?
- **Öko-Institut**: The model looks plausible.
- **ECOS**: Why is the battery repair rate only increased from 33% to 50%, and not higher? (in reference to slide 94)

- o **Fraunhofer:** Battery is replaceable without tools: Why is the increase not higher? This as a conservative asssumption on the rationale that not every user would replace a battery even if it's easier and more cost effective to do than in the current practice. It is actually a trigger moment when the battery fails if I replace that one with a new battery or if that's the moment to change over to another device. That's why definitely the repair rate in this case should be far below 100%.

- **Free ICT Europe Foundation**: Is there information available on the use of aftermarket (non-oem) spareparts?
  - o **Fraunhofer:** No, we didn't analyse this.
- **DTAG**: Spare parts are usually identical to components supplied to mass production. Has somebody compared the prices of the same part as a component and a spare part?
  - o **Fraunhofer:** For certain, there are differences and definitely the price of a spare part is usually much higher than just component costs, because of spare parts logistics to be accounted for. Also to store spare parts is kind of speculative task for the OEM, resulting potentially in an overstock. This is a cost issue which has to be reflected somehow somewhere.
- **Restart:** In calculating the costs and benefits of extending OS support, are you also calculating the impact linked to manufacturers stopping to provide security updates, rather than releasing new versions of the OS compatible with existing devices? The two are not the same - and in some cases installing a new version of the OS on an existing device could reduce their performance, and leading to premature upgrade - while continuing to support with security updates for longer wouldn't have undesirable effects
  - o **Fraunhofer:** What we address in DO11 is indeed a security update of a given version. But the solution by an OEM could be to provide an upgrade. This is then a viable option only as long as it does not have any adverse impact on the performance.
  - o **D. Polverini:** Specifically on the aspect of software upgrades and updates. We have some examples of similar requirements in other regulations, such as the eco-design regulation for displays, which foresees a kind of warning message indicating whenever there is an update, if this will bring changes in the product performance and energy consumption. Moreover I understand there is ongoing exploratory work by other colleagues at DG GROW concerning effects of the software updates on electronic equipment in particular regarding safety and compliance. We may also come back with some provisions here when being relevant.

- **ECOS**: on DO27 - the way this option is described in the report, the focus of savings calculations seems to be on the packaging, without addressing the savings in production / embodied energy / smartphone cost of the EPS not included - is this just an oversight in the description?
- **Belgian Ministry of Environment**: If you unbundle the EPS, charging may be done more and more wirelessly. You mentioned this can be less efficient (e.g. misalignment). Would this be significant ? Is it relevant to make a USB port for charging mandatory or to set requirements on wireless charging ?

- **Belgian Ministry of Environment**: You mention manufacturing requirements, but through ecodesign we cannot set requirements on how a product is manufactured. This is difficult to verify, and WTO rules/members may not allow it.
  - **D. Polverini:** Let me highlight the fact that here we have been discussing task 6, which is on the design options. Obviously we have built design options in such a way that they could pave the way towards potential requirements. In general terms the 'survival rate' of these design options when translated into requirements will not be 100%. Some of these design options might not become requirements. Specifically on the part of potential requirements linked to the manufacturing phase, then it is an open field. Nevertheless, we decided for the technical analysis to at least provide evidence of where are the environmental impacts and improvement potentials. Compared to "standard" energy using products such as refrigerators, mobile phones/smartphones feature a very relevant part of their consumption and impacts in the manufacturing phase. Technically now we have the information and how and if we will be able to formulate requirements will be the object of the activities to be carried out in the upcoming months.

- **Restart**: There's an additional problem: manufacturers which limit functionality of a product (removing some software functionality) in case a non-OEM part is used. Or having a persistent warning message in case a third party screen or battery is used.
  -> see discussion on serialization

- **ECOS**: In reference to the REP vs DUR path - it doesn't seem to make sense to have reparability aspects e.g. DO15 on battery removability in the DUR path scenario focused on high IP classes.
  - **Fraunhofer:** Actually it makes sense because this refers here to the joining technologies within the device, such as the use of adhesive strips with pull-tabs. It does not cover the fasteners to open the device. What actually is rarely seen in the market is DO23 reversible/reusable fasteners and DO17 battery removability w/o tools in combination with the high IP classes in DO4. That is why these two options are found on the different paths on slide 120.
- **ECOS**: It is still not fully clear. If you have a device, which is basically glued shut, than the savings potential for the DUR path is not given. Including these options just artificially boosts up the analysis. It does not matter, if the battery is fixed with removable fasteners, if you just do not get inside the device, or if you try to you are breaking something, so the battery is not replaceable. It seems to me the DUR path includes options which are not relevant in the end. If you cannot replace the battery successfully this option should not be included here.
  - **Fraunhofer:** But you actually can repair devices with a high IP class. It is nothing you are doing at your kitchen table, it is not a DIY repair, but it is done by repair professionals and even there is room for improvement, if you ease the job for professional repair shops. They can deal with these issues, they can open a sealed device, they can put it together properly again and this is actually also done by the OEMs for in-warranty repairs. We included in the DUR path rather those reparability

options, which make the life for professional repair shops easier and on the REP path we add those options which also would allow for DIY repairs.

- **ECOS**: Ok, understood. Can you please clarify this in the report.

- **FEICA**: FEICA (the Association of the European Adhesive & Sealant Industry) will provide written comments to the Task 6 report to thank you for your conclusions and highlight how versatile adhesive solutions contribute to an increased material and energy efficiency of the final electronic product as well as enhance sealing (water-tightness), thermal and electrical management (being isolators or conductors), safety (flame retardance/protection during dropping), design freedom with several releasability/repairability options, etc.
- **DTAG**: If I were to issue a wish to the adhesive industry than it is a glue with easy reversibility of adhesion ("gluing on demand"). There are today glues that harden by application by UV light, e. g. the polymerization of monomers is photochemically initiated. Many polymerization reactions are reversible, so it should be conceivable to initiate depolymerization also by photochemistry. Such a glue would very much help reparability.
- **FEICA**: There are adhesive solutions able to debond on demand, with use of electromagnetic irradiation (other than just heat), focused on the bonding line and being non-destructive to the assembled parts.

Task 7

- **DTAG**: I am checking in parallel the task 7 report. I see potentially two alternative future approaches here. One is creating transparency on the ecological performance of each device on the market which would be fulfilled by ecorating. It is to be expected that this will turn ecodesign features into competitive factors so that the market will take care of their implementation. The other approach is to regulate those ecodesign features right away which seems to be proposed in this chapter. Is that understanding correct?
- **DTAG**: Energy is only one of the ecological aspects. Why just an energy label? [referring to having energy label as a "stand-alone" policy option]
  - **Fraunhofer:** This is a general approach for analyzing the policy options. The general structure introduced here in terms of the options is not defined by us. This is just, let's say, the playing field which has to be analyzed or which are the basic different options. If just an energy label makes sense, it's another question. And nevertheless, with option 5 we have a combination of both, ecodesign requirements and energy labelling.

- **Öko-Institut**: Slide 136: Self-Regulation (EcoRating): How does the conformity assessment/ verification of requirements works in this initiative?
- **DTAG**: There will be verification.
- **Belgian Ministry of Environment**: The Ecorating seems like a weak tool: you only have to provide information. Also it is the manufacturers that should commit, not operators. I

didn't buy my phone through an operator (and get stuck to a contract). A voluntary agreement should cover 80% of the market. I doubt whether operators can do that.

- **Öko-Institut/ECOS**: We support the statement above.
- **DTAG**: The situation of the ecorating consortium is actually better than the chat suggests. 1. We are open to other operators to join and indeed expect it 2. We have almost all relevant vendors behind us that provide data.
  - **Fraunhofer**: I would fully confirm the arguments in both direction. Definitely, the requirement on the covered market share is not met. In that sense and as there is no claim to propose this actually as a Self-Regulation Initiative it is not named in the policy scenarios hereafter "self-regulation" anymore. But at least from the basic approach it definitely looks pretty much like a kind of self-regulation. If enough players in the market would like to push this forward, and those indeed needs to go beyond the telecom operators, who have a large although still limited influence and definitely not influence on 80% of the market, and if this would be a system which is followed by retailers, which is followed by the OEMs, and covers also other distribution channels, then there might be the chance to get into this range of 80%. I do not coordinate the establishment of such kind of voluntary agreements here. It's only to say that there's some kind of seeds from which something might grow if relevant actors take action. And the other observation is fully correct: There are no minimum requirements. It is as such a scoring. And therefore it is indeed fully left to the market and the market response, if users will then acquire more sustainable devices or if the OEMs shift towards designing more sustainable devices. All this is then fully left to the market.

- **EEB**: To what extent would option 2 ecorating be compatible/compliant with the forthcoming legislation on green claims? This information would be self declared? What verification or transparency process would be in place? Even if this would use the PEF methodology, there is no PEFCR for smartphones, hence no benchmark, so comparability is very difficult, potentially misleading. Why isn't a broader set of measures considered relevant for a label developed at the EU level, notably on repair, considering we have a methodology ready for this prepared by the JRC…
  - **D. Polverini:** There is an ongoing initiative on so-called green claims and related standardisation of the language with which to formulate green claims, and telecom operators or stakeholders preparing the Ecorating scheme are also in touch with DG Environment. What we do here is to try to estimate within the analysis the effect of policy options other than the regulatory ones. Preliminarily, at least on the information we have by now, this would not qualify as a voluntary agreement under the sense of the Ecodesign Directive. Nevertheless, we wanted to include it in the analysis for the sake of completeness, to try to get an idea of the impact of the various effects in the market.

- **ANEC-BEUC**: While the French repairability index establishes a very important precedent as regards to material efficiency requirements, it is important that the focus remains on making products of better quality and less prone to wear and tear of single components that artificially shorten products' lifetime.

- **Öko-Institut**: Could you please explain the reason for not considering taking up the French repairability label as a whole as a mandatory ecodesign requirement? This would have ensured a more harmonized approach at the EU level.
- **iFixit**: Fully agree reliable and verifiable information on reparability is needed at the point of sale, and that the French index serves as an appropriate base to be extended to tablets.
  - o **D. Polverini:** we are in touch with the French authorities in charge of preparing this interesting piece of legislation. As a "label" we have at the European Union level the Energy Label, which is mainly on information on the energy consumption or efficiency in the use phase. It could be complemented with some information regarding, for example, the reparability indexMoreover, we still have to clarify, in technical as well as legal terms, whether any energy labelling proposal would target the smartphones/tablets or a component of them (namely, the battery). Nevertheless, again, we are in touch with the French authority because there are a lot of interesting elements which could potentially be translated – for instance - into ecodesign requirements. Another specific but important aspect, one of the elements contributing to the ranking in the French labelling scheme is the price of some spare parts. This, for the implementation of eco-design, would be certainly much more challenging if not impossible to be done at level of all member states.

- **ECOS**: Unbundling seems only to be addressed by user information - it doesn't seem that this would be effective compared to a regulatory approach.
- **Belgian Ministry of Environment**: Why does task 7 say unbundling is user information, covered by PEF score ? Shouldn't it rather be a requirement not to put an EPS in the box?
  - o **D. Polverini:** First of all, a very generic comment (not related to this specific reply). Some comments show a kind of "appetite" towards specific requirements rather than generic requirements even if it's not fully generic in the sense of ecodesign directive, but let's say, requirements based on scoring schemes. These are draft conclusions, but let's see all the feedback. Let me also say that task 7 is the one most related to policy conclusions, which is then where the Commission carries on the analysis in the next months to come. Eextremely useful from the study is certainly the support in the technical analysis, to say, what we have seen particular in task 6 concerning the relevance and the feasibility of design options and related environmental gains. How to translate them into actual requirements as of today, we don't have the final words. There will be a lot of work ongoing, specifically on the point of unbundling of the charger. Explicitly using ecodesign to forbid a product to be equipped with certain components doesn't seem so strict forward in legal terms. We have some experience under ecodesign where we make compulsory for the product to be equipped with certain features and certain components. Classical example: non-residential ventilation unit need to have a heat recovery system. We don't have opposite examples. Let's also not forget that we have the parallel ongoing initiative on common chargers. As a matter of coherence the commit we gave to the consultants in this ecodesign study was first of all to access the environmental effects/ impacts related to a solution without charger and if anything, at least for the

time being, to propose a solution such as information or linked to scoring system, bearing in mind that there is another initiative on the common charger.

- **Öko-Institut**: Slide 137 (Option 3): Why is the replaceability of the display unit not considered? In the multi-criteria repairability scoring? If yes, then it may rather dilute the importance of such an important repair related aspect.
- **UBA**: Again: Why only OS support for only 2 years. In many cases it the state of today and not an ambitious claim.
- **ECOS**: On policy analysis option 3: the study shifts from quite a comprehensive analysis of design options that identifies a wide range of possible requirements with low cost or cost savings as well as with cumulative improvements in the environmental credentials of products, to a very limited policy package that excludes many of these options for no apparent reason. Could you please explain why design options such as display removability, battery status/management, reversible/reusable fasteners etc have not been followed through into policy options?
  - **Fraunhofer**: They are actually addressed, but in the sense of generic requirements in the scoring. You would receive a better scoring for example, if you implement fasteners which are removable and reusable. All this is then addressed in the generic requirements and only some aspects move here into the specific requirements. For certain reasons where specific requirements seem to be the more appropriate approach, where there is good evidence in the market that certain things can be achieved or could be regulated as a minimum requirement - under certain conditions, with certain disclaimers -, banning the worst performing devices from the market with something like a minimum IP class for example or a minimum rather conservative OS support time and to leave everything else than rather to generic requirements, meaning scoring systems and let the market decide then, which devices are really absorbed by consumers. I think this mirrors pretty good some evidence on user perception, what has been reflected in task 3, that there is a very strong interest in more sustainable devices. All the discussion about the environmental impact of smartphones, I think is in the meantime echoed by consumers really asking for more sustainability, but it is just that the transparency is missing: what is a sustainable device? And such kind of transparency can be provided through such kind of scoring systems. It might be even more appropriate to differentiate for the consumer: What is a device being good in terms of reparability? What is better in terms of durability? Then the user can reflect: I am a more gentle user of this kind of devices or I am the one dropping my devices on a daily basis. Then I know for myself which scoring is more important to me. In that sense most of the design options analyzed before are addressed but through the scoring system.
- **Öko-Institut**: At least for display units, it will be important to have them under specific requirements. Even though display unit and battery are critical life-time limiting components, it is important to ensure the availability of other parts, such as audio module, camera, home button, speakers etc. for a minimum number of years as well. Did I understand correctly that they are not considered in the option 3? They are considered in the planned French repairability index? See the list of malfunctioning and functional parts in table 2, page 16 of task 7.

- - **Fraunhofer**: They are considered in the French scoring system. We simplified the overall analysis to few high-priority parts where we had solid evidence on defects. As mentioned in the presentation there are other components which indeed also can fail. To our insights, these are less frequent an issue, and they are sub-summarised in our analysis under "other parts", but it might be worth to put them here on the list of spare parts which should at least be available to repair professionals. This list could be extended, this is not a closed list.

- **Apple**: Why do you prefer a mandatory requirement for a user replaceable over professional service replaceability? why is a service not equally convenient? Per your task 3 smartphone and tablet batteries nowadays only need to be replaced between 0 and 1,x times over the product life. As mentioned in part 7: A user replaceable battery requires extra housing compared to embedded batteries and thus tend to have a lower capacity than same-size embedded batteries. This also tends to have an adverse effect on battery endurance per cycle.
  - **Fraunhofer**: At least there is the issue that batteries are to a significant extend a lifetime limiting factor for devices- not for all, not for all brands, not for all conditions. But without question it is a significant share of phones and tablets the aspect where the users say "Well, battery doesn't last anymore, let's go for a new device." This is definitely a lifetime limiting factor and this is why user replaceable went in here as the most convenient way to mitigate this problem for the user and to extend the lifetime. So therefore, there is a need to at least replace the battery once in a lifetime. As soon as it seems replaceable, it will be done more easily which means more frequently. So that's a trigger point in the product lifetime where somebody says : "Now I have to decide, let's get rid of the device or let's get it repaired". But if an OEM provides a convenient service and if it comes with a reasonable price then this is a viable alternative to a user replaceable battery.
- **Öko-Institut**: In general, it is understood that complex devices, such as smartphones, will be difficult to repair by non-professionals. So, improving the conditions of independent and professional repair is considered to be important. However, considering the "Right to Repair" debate, as also endorsed by the EU Environment Council yesterday, it will be important to extend the repair related requirements (e.g. availability & delivery of spare parts, access to repair related information etc.) also to end-users. At least, there are no negative consequences expected for end-users from this requirement. This approach will be right step towards supporting the DIY movement, although the share of consumers undertaking major & complex repairs would probably still be low. At least, for repairs related to main lifetime limiting components, such as battery and display units, it should be possible for the end-users to replace them without any complications.

- **Belgian Ministry of Environment**: If you try to make a "multi-criterion reparability scoring generic requirment", please call it a "reparability score" and try to have it as a label. Preferably integrated with the "reliability score". So you have a durability label.
  - **Fraunhofer**: So this is really the question whether this should be merged in the durability score somehow. Because I would say, fully open to both approaches, there are pros and cons for both approaches. So having fewer scores of course makes life

easier for the consumer to make a decision. On the other hand having more scores and having a distinction between reparability and reliability, would leave the choice to the consumer to reflect "what seems to me more important to me personally with my user behavior. I am more the person who has to rely on repair, would I be the one willing to do repair on the kitchen table?" Then I can give preference to a higher reparability score. But if I am the one saying, well I don't know at all how to repair and if I have a defect I replace my device anyhow, then durability matters more.

- **ECOS**: The scoring approach makes sense when there's a need for flexibility due to trade offs, but the study shows that most of the options are easily achieved in lifecycle cost terms without trade offs so there doesn't seem to be a need to push in the direction of a scoring approach here. It seems that it could all be handled by a package of regulatory requirements.
  - o **Fraunhofer**: Looking at the outcome of the task 6 analysis and strictly following the MEErP methodology and approach, this is actually a valid conclusion.
- **Belgian Ministry of Environment**: But the reparability and reliability route should be evaluated on the same basis: years of lifetime. So you have to assess them together.
- **DTAG**: I think there seems to be a trade-off between reparability and durability. A rating would allow the market finding the best compromise.

- **ECOS**: Option 5: why is wider labelling not considered on durability / reparability aspects rather than just energy?
  - o **D. Polverini:** Just to clarify, because I have mentioned it earlier and I have seen many interventions, so maybe it was not fully clear. This is an ecodesign preparatory study and as such it has to address and reply to the question about feasibility and relevance of ecodesign and energy labelling measures, within the legal framework of the current Ecodesign directive 2009/125 and the energy labelling regulation 2017/13. The energy labelling regulation foresees a labelling scheme on energy related aspects. The integration of other aspects (durability/ repairability) still has to take place (there has been a JRC study one or two years ago. But so far, no implementatoin in practice). Other options on labelling schemes about durability/ repairability while certainly interesting conceptually would not be directly implementable at least within this legal framework. So that's why the choice of the analysis of policy options focusses on what can be implemented with the current legal framework.

- **VZBV**: Mandatory information by the producer about the planned lifetime and software updates are crucial for consumers when they decide for or against a repair. Will this be regulated in a horizontal standard regarding durability?
  - o **D. Polverini:** We now have finalized horizontal standards under mandate 543 (on the material efficiency aspects for ecodesign). The idea is then further product specific standards would follow to provide assessment approaches, calculations at product specific level. Within a potential standardisation request on smartphones / mobile phones, aspects related to development of standards on reparability, for example, would certainly be included there and would certainly build on the horizontal

standard. Just to mention the French repair score makes abundant use of the concept behind the horizontal standard. So, now that we have the horizontal standards, we need to go for the product specific level now to develop the detailed methods.

- **Apple**: Why are policy options not differentiating between the different BCs? They clearly have different use cases → failure modes and hence would benefit from differentiation.
  - o **Fraunhofer:** The way task 7 is presented by now, this is not in detail differentiated, ewe just mention which sub-groups are affected. How the rating, for example, might look like when it comes to scoring of the reparability - let's just make the assumption of copy and paste of the French scoring system -, then there is definitely the need to adapt the scoring scale for tablets or feature phones as well. There are differences in failure modes and user behavior, also regarding battery lifetime. This should be reflected once some kind of scoring or information requirement is on the table, to flash out, which emphasis is put on different technical/ user aspects. The prior tasks provide a sound basis for such differentiated approach, Task 7 does not exactly mention yet how the scores might look like. Definitely not all product sub-segments should be assessed the same way, so point taken.
- **Apple**: I would argue differentiation is also needed for the minimum requirements

- **ANEC-BEUC**: ANEC and BEUC will provide written comments on policy options. In general, from the consumer's point of view, policy option 5 ecodesign + energy labelling (with battery endurance benchmark as basis for defining energy efficiency classes for Smartphones), would be most appropriate, as evidence from energy labelling of other product groups has shown the impact of energy label for driving consumer purchase decisions and markets.

- **Belgian Ministry of Environment**: I don't think 'energy' of the handset is the issue to focus on. Materials are at least as important. And energy depends more on user behaviour and the servers and datacentres that host all user activity.

- **DTAG**: 80% of the GHG emissions are allotted to Smartphone production. Energy consumption durch use is just a minor contributor. Why not going instead on a holistic assessment of the ecological performance?
- **Vodafone**: Some background on Eco rating: The current consortium of Telco's came together for more than one year to harmonies the eco rating. Many had launched an Eco rating before but customers were confused with different principles that were leading into different scores for the same model. This fragmentation was also negatively perceived by the suppliers. In surveys, we found out that a reasonable amount of customers are seeking for a eco rating. More than 15 Suppliers now fully support the methodology. Any party can join the Eco rating.
- **DTAG**: What about a combination of Ecodesign and Ecorating?
- **DTAG**: It seems as if, when compared alone, the ecorating scenario is superior to the energy label scenario. So ecodesign and ecorating should be even more synergistic.

- **Vodafone**: Eco rating will be not limited to EU27; it will be lauched also in other non EU27 countries - i.e. outside Europa like South America, Africa, ..
- **Vodafone**: Engery related aspects are also included in Eco rating
- **DTAG**: Which is important for the environment.

End of Meeting