EUROPEAN ENVIRONMENTAL CITIZENS ORGANISATION FOR STANDARDISATION

ECOS

ORGANISATION EUROPÉENNE ENVIRONNEMENTALE CITOYENNE POUR LA NORMALISATION

**ECOS on behalf of European environmental NGOs**
**Comments on draft Tasks 1-7 of the preparatory study for Power Cables**
**(Lot ENTR 08)**

December 2014

Power cables present an important energy saving potential, with up to 13.87 TWh/year by 2025 according to draft Task 7. We therefore welcome their inclusion in the 2012-2014 Ecodesign Work Plan and the subsequent undertaking of this preparatory study.

We consider possible product policies such as Ecodesign requirements or a label as positive and plausible policy options for this product group, and we think that they deserve a more thorough analysis than that implemented so far in the preparatory study. In this context, we invite the study team to reinforce their investigation taking into account the following points:

Objectivity and completeness of study assessment

The dependency on industry-funded studies raises questions regarding objectivity and completeness of the study assessment. Scientific rigour is essential to a study of this bearing. Where data is lacking or withheld, it is important to make reasoned assumptions to fill gaps and ensure the study covers all important considerations and scenarios at sufficient depth.

Scope – exclusion of residential circuits

We regret that it was decided to exclude residential circuits from the scope and believe this is partly a consequence of the study's focus on cross sectional area (CSA). Savings in the residential sector are expected to be smaller but we still consider these to be worthwhile. The policy assessment should include at least a consideration of the applicability of recommendations to the residential sector

Technology options

Options for BAT in relation to materials are overlooked. Technology options should include material efficiency and alternatives to CSA. Research into material efficiency and/or building assumptions may be necessary as there was little stakeholder data provided.

Policy scenarios

The policy assessment is narrow and lacking ambition. It should be improved thanks to a thorough assessment of existing international initiatives and a complete assessment of the range of possible policy approaches. Task 7 should be reworked to consider the full range of policy options available. The goal should be to reduce losses and environmental impacts of power installations, possibly via Ecodesign regulations. A shift towards resistance/impedance (Watts / mm / Amp or similar) as a defining characteristic of cables rather than CSA should be considered.

Resource and Materials:

Resource efficiency considerations should be further explored. The material impacts increase of the suggested CSA solutions are considerable. Copper impacts, especially price fluctuation should be considered in the sensitivity analysis. Whilst some previous assessments found copper to be of low criticality, these assessments did not account for the considerable surges in copper use that would result from increases in the cross sectional area being put forward as technology options in this study. Therefore it is important that this study carries out a proper impact assessment of their recommendations over and above previous studies on criticality.
In addition, technology options should include material efficiency options, such as: alternatives to increased material technology options, alternatives for insulation / sheath material to reduce impacts, options to encourage sheath recycling, assessment of benefits of early replacement, options to encourage recycling of cables within the EU.

The table below lists and further details our comments in this direction.

- *General reply ofVITO:*

*On objectivity:*

- *We don no agree this because anyone, including ECOS, was invited to fill in and supply enquiries that were sent out twice. Therefore we would rather have seen reaction of ECOS to supply alternative data at the time it was needed and asked for but not after completion. Also, cables are not installed by regular end users but by installers(industry) and therefore it is logical that they supply information .*
- *In general we agree there was a lack of interest and awareness, as we mention in Task 3. We have included policy recommendations to increase awareness that will also source more information. In reaction to this we will add a new section in Task 7 to update this study after 5 years when more information should become available. (section on timing of policy measures)*

*Scope:*

- *This was discussed and agreed in the beginning of the study. However we agree that in Task 7 a policy recommendation in line with the findings of Task 1 should be added, it is related to the lack of renovation in existing buildings.*

*Technology:*

- *We do not agree this statement, be more specific which option do you intend and why.*
- *More information on halogen free cables was added in task 3, please note that they as well can be recycled. Hence all materials can be recycled.*
- *As a reaction to this we add in Task 7 a section why no product policy recommendations were given in the framework of this study.*

*Policy options:*

- *This part will be further elaborated in the final version, nevertheless possibilities matching Ecodesign regulation are limited.*
- *More explanation is given in the introduction of the section on scenarios.*

*Resource and materials:*

- *All tools in line with MEErP will be available after the study for the EC.*
- *We will add a section that repeats the conclusions on recycling in in the policy recommendations in Task 7.*
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# DG ENTR Lot 8: Ecodesign for Power Cables in Indoor Electrical Installations

**Organisation: ECOS** **Name: Catriona McAlister / Chloe Fayole** **Date: 19/12/2014**

| Ref. | Section | Page | Topic | Comment | Proposed change | VITO reply |
|---|---|---|---|---|---|---|
| **1** | General | General Comment | Objectivity and completeness of study | We would like to reiterate a point previously raised by EDF[1]. The dependency on industry-funded studies raises questions regarding objectivity and potential conflict of interest. Whilst we recognise that the study budget is limited, scientific rigour is essential to a study of this bearing. All data should be scrutinised, and findings only taken on board if they stand up to an objective technological assessment. Where data is lacking or withheld, it is important to make reasoned assumptions to fill gaps and ensure the study covers all important considerations / scenarios at sufficient depth. | Where data is provided it should be carefully examined for robustness (for example, see later comments on the low criticality of copper).<br><br>Where stakeholders do not provide data, we suggest the contractors build scenarios based on assumptions (that can be consulted upon) to ensure the range of options is adequately covered – see further comments in the various areas for details. | We did sent out an extra enquiry and used the received data. Anyone could fill in and contribute, including ECOS. But as noted interest and awareness of stakeholders is weak, therefore other actions are needed as proposed in the policy options |
| **2** | General | General Comment | Resource efficiency in:<br>▫ Technology options: task 4/6<br>▫ Policy scenarios: task 7 | The contractors stated in the stakeholder meeting an assumption that the focus of Ecodesign is energy efficiency, especially as the title of the product group includes "losses". It was stated that they therefore had not addressed resource efficiency considerations in any depth.<br>In fact:<br>i) The recast Ecodesign directive (2010/30/EU of 19 May 2010) aims to prompt "manufacturers to take steps t**o** reduce the consumption of energy and other essential resources of the products which they manufacture"<br>ii) The Ecodesign preparatory study tools were recently revised in order to ensure that material efficiency could be properly taken into account2.<br>iii) The reason power cables were prioritised in the working plan 2012 to 2014 was due to their wider environmental impacts. | Work by BioIS on the MEErP methodology and by JRC on material efficiency in Ecodesign can provide direction on how to consider material efficiency in an Ecodesign context. In addition, we suggest that the study contractors appeal to Europacable to provide copies of their studies to inform a deeper analysis of the potential for technology and policy measures including options to improve resource efficiency. The OVAM report referenced in these comments also provides some useful insights.<br><br>In the event of the Eurocapable reports not being provided, we suggest the contractors make reasoned assumptions.<br><br>Development of the following should be considered: | A new section explaining potential policy measures related to resource efficiency is added in Task 7. |

1 Questions from and answers to stakeholders regarding draft documents Task1-3 (version 2) and Task 4-5 (version 1) published on study website– EDF comment date 04/06/2015,

2 See the BioIS guide for practitioners to analyse material efficiency in ErP by using the EcoReport 2013.

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| | | | | In addition, Europacable stated in the stakeholder meeting that internal studies had been carried out on the material side and that whilst "technologically there is a lot possible" with regards to improving material efficiency, the barrier is cost. This supports further investigation into the material efficiency considerations in terms of research into technology options and the consideration of policy scenarios. | **Technology:**<br>i) Options for BAT in relation to materials. E.g. design options featuring alternatives for insulation / sheath material: use of recycled plastics (how policy could resolve manufacturer concerns around quality and encourage greater use – see [3]OVAM report), halogen free sheathing[3], alternatives to PVC[4] (or recycled PVC), PVC as an alternative to XLPE/PEX[5].<br>ii) Technical alternatives to increased material (CSA) options, even if these need to be considered at a circuit level.<br>iii) Consideration of any other resource efficiency options. See other preparatory studies for examples as to how innovative technology approaches have been considered – for example, the Sound and Imaging preparatory study combined operational mode requirements, product light-weighting, APD and reusable components.<br>**Policy:**<br>iv) Options to facilitate cable recycling (to avoid downgrading the insulation material and to encourage greater recycling - for example of insulation outputs of manual stripping processes)[6].<br>v) Assessment of benefits of policy encouraging early replacement (see | |

3 The presence of halogen due to flame-retardants and substances of very high concern (SVHC) have a major impact on recyclability of polymers. It is useful to explore how essential these components are and where policy could incentivise a move away from these.

4 PVC used in cabling represents 7% of EU PVC use – some 364 ktonnes, with only 88.5 ktonnes of recycled. Alternatives to traditional PVC include phlalate-free PVC, PE and PFP. Use of bio-plasticisers can facilitate cables with low volatile organic content. Use of technologies such as VinyLoop can recycle PVC from electrical cables for reuse without downgrading (although solutions to get around changes in material colour and process costs would need to be considered). Flanders PlasticVision / OVAM report: "Proposal on material criteria for the product group: "Cables in Closed Circuits",

5 Alternatives include CPE and EPR

6 For examples of ecodesign policy addressing end of life impacts, please see the November 2014 draft requirements for electronic displays "Annex iii : End of life requirements".

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| | | | | | calculations suggested by the JRC in Annex 5 of JRC Technical Report n° 3.)<br>vi) Policy options to encourage recycling of cables within the EU (currently cables with copper content below 40% are shipped outside EU for recycling[7]). | |
| **3** | Task 1, section 1.3 (as background to Task 7) | Page 60 | Existing legislation | The assessment of existing international policy states *"A number of building energy guidelines, standards or codes go beyond the existing electrical safety and operational requirements by adopting more stringent maximum voltage drop requirements to limit circuit impedance and thereby wiring energy loss."*<br>This is reiterated in the task 3 report for the working plan[8]):<br>"*In some countries IEC recommendations on max. voltage drop[9] are legal requirements / included in local legislation*."<br><br>However, only the North American ASHRAE/ IESNA 90.1 standard and the National Energy Code for Buildings of Canada (NECB 2011) are mentioned. The recently revised Californian Energy Commission requirements that include maximum voltage drop requirements are not mentioned. There is no detail on how international policies go further in terms of levels and legislative approach. This is essential information to inform task 7. | A more thorough review of international policy should be implemented under Task 1 to inform Task 7. This should include detail of all the policies that go beyond the existing electrical safety and operational requirements by adopting (for example) more stringent max voltage drop requirements (policy name, policy type/mechanism etc). Detail comparing what the exact requirements are should be included. Other preparatory studies can provide examples of the level of detail at which this has been implemented for other product groups. | Those proposals are in task 7<br><br>More identical samples will not influence the outcome. |

7 Flanders PlasticVision / OVAM report: "Proposal on material criteria for the product group: "Cables in Closed Circuits", page 4.

8 http://www.ecodesign-wp2.eu/downloads/FINAL%20REPORT%20Task%203%2016-12-2011.pdf

9 [In informative annex of standard IEC 60634-5-52) The IEC recommends a maximum voltage drop at the connection terminals of the electric load (the end point of the circuit) of 3% for lighting circuits and 5 % for other circuits, when supplied from public voltage distribution. And for installations when supplied from private LV power supplies, 6% for lighting circuits, 8% for other circuits.

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| **4** | Task 1, summary | Page 10 | Scope: Residential circuits<br><br>Technology options (task 4/6)<br><br>Policy options (task 7) | It is stated that:<br>• Losses in the residential sector are low - estimated at <0.3% (3.35 TWh), as opposed to 2% in other sectors<br>• Residential cables should be in the scope of Tasks 1, 2 and 7 (partly) but not for Tasks 3-6 on environmental improvement potential.<br>• LLCC solutions could not be identified for residential sector (due to focus on CSA).<br><br>However, we suggest that the range of technology/policy options considered to date could be widened to consider other options that could result in LLC solutions in residential circuits taking into account that:<br>• When the cables are placed on the market, it is not known in which sector the power cables will be used.<br>• Requirements suggested are focused on information requirements, so savings may be achieved at low or no cost.<br>• Savings in the region of 1TWh are still significant, even if relatively low compared to opportunities in other sectors.<br>• Non CSA measures (e.g. policy means of encouraging shortened circuit length) have not been assessed and may represent a feasible LLCC option for residential | The preparatory study should include:<br>• Alternatives to CSA as a technical solution (and particularly as a metric for policy) - e.g. circuit length/topology that would not have such large material impacts.<br>• At least a qualitative consideration of the applicability of recommendations to residential applications | A section is added in Task 7 related to policy recommendations for cables in the residential sector |
| **5** | Task 7, Section 7.1 | Page 10 | Policy analysis | There are the following issues with the current assessment of possible policy options:<br>i) The policy analysis focuses on technical scenarios based around increased CSA of cables, rather than policy scenarios.<br>ii) Resource efficiency options are not considered. | As this is a study to assess what could be achieved under Ecodesign legislation, we suggest that in task 7 the study contractors explore innovative policy options complying with i) the Minimum Energy Performance Standard (MEPS), and ii) Energy Label approaches established under the Ecodesign directive. Please see the annex at the end of this document for details. It is worth referencing other preparatory studies to see how these have assessed policy – for example, in the Sound and Imaging policy scenarios, detailed consideration was given to potential levels at which to set policy options based upon | Labelling does not make sense, the proposed product Information requirement should solve the issue. |

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| | | | | | the levels currently referenced in existing legislation.<br>The goal should be to reduce losses and environmental impacts of power installations. A shift towards resistance/impedance (Watts / mm / Amp or similar) as a defining characteristic of cables rather than CSA should be considered.<br>Approaches from international policy could be used to inform requirements within these scenarios, and resource efficiency considerations as well as informational aspects could be included. | |
| **6** | Task 7, Section 7.4 | Page 37 onward | Sensitivity analysis | The study states in task 2 that "*Conductor prices are very volatile, therefore it is common to correct cable prices with a surcharge depending on the market price*."<br><br>Meeting discussions and previous stakeholder comments suggest there is disagreement as to whether copper can be considered a scarce resource. In previous comments from Nexans[10] they stated *"...copper is highlighted by Europe as an important material considering resource efficiency. Such aspect should be pointed out and taken into account into the environmental study.*" Whilst a 2013 JRC assessment considered copper a material of low criticality[11], it is important to consider this study in context. The focus was upon the metals critical to the decarbonisation of the EU Energy Sector – it focused on very specific technologies. In studies addressing different sectors or based upon different assumptions, the results could be quite different. In particular, these studies do not account for the huge increases in copper use that would result from the recommendations being made in this preparatory study. Therefore it is the responsibility of this study to carry out that additional assessment. | Variations in copper price should be considered in the sensitivity analysis.<br><br>We urge the preparatory study team to more thoroughly evaluate the impacts of the suggested technology options to increase cross section areas of power cables, as it has not been assessed in the previously carried out studies. The assumptions from other studies that copper is non-critical do not account for the impacts increases in CSA would have.<br><br>We support the change previously suggested by Nexans to *"Include a Resource depletion indicator in the environmental evaluation, specifically when evaluating use of higher cross-sections."* | Insulated copper cables are used in any electrical product and therefore commonly accepted data is included in MEErP.<br><br>Not agreed. LCA impact from increased CSA is calculated with the MEErP and study model? |

10 Questions from and answers to stakeholders regarding draft documents Task1-3 (version 2) and Task 4-5 (version 1) published on study website 26/05/2014

11 "Critical Metals in the Path towards the Decarbonisation of the EU Energy Sector: Assessing Rare Metals as Supply-Chain Bottlenecks in Low-Carbon Energy Technologies", R.L.Moss1, E.Tzimas1, P.Willis2, J.Arendorf2, L.Tercero Espinoza3 et al. (1) JRC – Institute for Energy and Transport (2) Oakdene Hollins Ltd (3) Fraunhofer Institute for Systems and Innovation Research ISI

## Annex - Potential policy to consider in task 7

| Possible policy option | Policy/product characteristic | Comments |
|---|---|---|
| "Energy" Labelling | A to G labelling of cables according to losses per length cable / r<br>resistance per km (potentially linked to MEPS on worst performing label class). | efficiency considerations:<br>- Copper content % (over 45% to ensure recycling in EU)<br>- Ease of plastic recyclability – lack of fire retardants in cables for non-critical installations. |
| Minimum Energy Performance Standards | MEPS based off loss ratios, maximum voltage drop or similar. | These can be built upon existing international policy requirements, once the necessary research for Task 1 section 1.3 (see comments) is carried out. |
| Information requirements | Such requirements need to be combined with another policy approach to be feasible. The preparatory study suggests: **On the cable,** complementary to CSA:<br>o Indication of the maximum DC ohmic resistan<br>kilometer at 20°C (R20 expressed in Ω/km) **On the package and sales websites:**<br>o Cable losses per kilometre (VA/kilometre) at 50 % and 100% of the maximum current-carrying capacity of the cable in open air;<br>o Indication of the real measured DC ohmic resistance in line with IEC 60228. (R20 expressed in Ω/km). | The ELEKTRO+ (German) Initiative does some of this, and the Product Environmental Profile (PEP) Eco passport may also provide an |
| **Recommendations on standards** | | |
| IEC/EN Standards, guidance etc | Changes could be possible to the following:<br>i) Recalibrate safety standards to higher CSA for rated voltage<br>ii) More stringent max resistance in "EN 60228: Conductors of insulated cables"<br>iii) "Harmonized Document 60364-1 (IEC 60364-1)"[13] could incorporate "IEC 60364-8-1: 2013: Low voltage electrical installation Part 8-1: Energy efficiency" which provides a foundation approach to reduce losses.<br>iv) TR 62125 on info provided to user to influence CSA choice. | Wiring codes of EU countries are based on IEC 60364 – so a change this<br>It could be difficult to justify changes in safety standards to reflect energy efficiency drives, especially considering the potential additional cost.<br>For updates to standards to have an influence, they would need to be initiated as soon as possible to avoid in the availability of harmonized approaches at the time the regulation comes into place. |

**Comment [PVT1]:** Thank you for the input. Proposals are in the final verion.

**Comment [PVT2]:** It has been added in task 3 that halogen free cables are thermoplastic and can and are also recycled. Hence it is not an issue.

**Comment [PVT3]:** We checked elektro-plus.com again and they say much about energy efficiency such as smart submetering but nothing specific on optimizing cables to reduce losses The target are domestic installations , which were not in our scope.

**Comment [PVT4]:** It is in 7.1.2.2.1.1 e consider to highlight this more

12 Task 1 of the preparatory study states “The maximum resistance of the conductor (Ω/km) is the most important specification related to the energy losses in the power cable”

13 This document provides the rules for the design, erection, and verification of electrical installations.