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 From : Wai Chung Lam Annex(es): - presentation 3rd stakeholder meeting
 - (draft) reports Task 1 – Task 7
 (see documents on www.erp4cables.net)
 To : Cesar Santos; ENTR Lot 8 Stakeholders
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Minutes of 3rd stakeholder meeting for the preparatory study Lot 8 on Ecodesign for Power Cables

BREY Building, Brussels, November 13, 2014

Present	Name	abbr.
European Commission		
DG Enterprise	Cesar Santos	CS
Project Team		
VITO	Paul Van Tichelen	PVT
VITO	Dominic Ectors	DE
VITO	Wai Chung Lam	WL
Stakeholders		
Europacable	Annette Schermer	AS
University of Bergamo	Angelo Baggini	AB
CENELEC TC64 WG29	Jacques Peronnet	JP
EDF	Maud Franchet	MF
CENELEC TC20	Helmut Myland	HM
Deutsche Energie-Agentur GmbH	Rafael Noster	RN
BAM (German Federal Institute for Materials Research and Testing)	Daniel Hinchliffe	DH
AIE (European association of electrical contractors)	Evelyne Schellekens	ES
ECOS / Sea Green Tree	Catriona McAlister	CM
ECOS	Chloé Fayole	CF
Belgian administration Environmental product policy	Bram Soenen	BS
OVAM (Public Waste Agency of Flanders)	Marc Leemans	ML
Aurubis Belgium	Mukund Bhagwat	MB
ECI (European Copper Institute)	Fernando Nuno	FN
ECI (European Copper Institute)	Laia Perez Simbor	LPS

Objective of the meeting

Stakeholder consultation in the framework of a study with regard to Ecodesign of Power Cables (Lot 8) accomplished under the authority of DG Enterprise of the European Commission (EC), under specific contract No 185/PP/ENT/IMA/12/1110333-Lot 8, within the multiple framework service contract No FC ENTR/M29/PP/FC Lot 2, preparatory studies and related technical assistance on specific product groups.

The main objective was to discuss the technical aspects related to the study (Task 1-7 reports).

Agenda

- Welcome
- Short presentation of participants
- Tasks 1-3
- Tasks 4-6
- Break & lunch
- Draft Task 7
- Any other business
- Planning stakeholder feedback and finalisation

Minutes

▪ **Welcome (PVT)**

This is the last meeting to meet each other before the final delivery of the study to the commission.

▪ **Short presentation of participants (all)**

See page 1.

▪ **Tasks 1-3 in a nutshell, incl. latest enquiry input (PVT)**

Task 1 (PVT)

See powerpoint presentation.

abbr.	Comment/answer
JP	A comment on the IEC 60364-8-1 [mentioned on slide 12], the voting on this standard is positively and will be published within this month [November]. On the standard at European level, there are already positive votes. Tomorrow [14 November 2014] will be the final voting and if that is positive too, then it will be published within two months. So both standards will be published soon.
PVT	OK, if you can provide us the latest news these coming weeks we can add it to our study.
JP	Yes, I can provide the latest news.
MB	The last line 'Qualitative but not quantitative?' on slide 12, what is meant with it?
PVT	With quantitative is meant 'minimal benchmarks' or in terms of legislation 'the minimum quality that is wanted'. In the report the used phrasing must be correct. What we see is that policymakers want minimal benchmarks, which is also in the case of energy efficiency: the state of art should be this. I think all these ideas are in this standard and are a very broad area. But it doesn't indicate what the minimum are for implementation. For example for this case, this could be that only heating, ventilation and air-conditioning connected are taken and the cable losses in lighting circuits also. Mainly typical loadings profiles and sample calculations are missing.
JP	One of our problems was to convince especially the installer, as the focus was safety at first

	and now we are trying to shift from safety towards energy efficiency. The first step was very difficult to push every concept of energy efficiency, so we have made some consensus. In the future for sure, we will push more towards energy efficiency in the standard but step by step. Acceptance of the majority is needed, that is why it sometimes can be seen as slow.
PVT	Yes, it is important that the standard is voted as it as a first step it could be updated in a later revision.
JP	Exactly.

Task 2 (PVT)

See powerpoint presentation.

abbr.	Comment/answer
CM	A question related to the sensitivity analysis and copper. The copper price, doesn't it have a substantial impact on the feasibility of certain solutions?
PVT	There is some documentation on the copper price.
MB	Can I comment on this? We follow the copper price regularly and the price depends on how much China is storing it in warehouses and uses it to finance other growth opportunities. So it has less to do with the demand and supply of copper, but more with its storable value and financeability value. This means that it can be stored at a warehouse and that that warehouse can be secured much better and at a cheaper cost than gold or silver. This is not something what only I am saying. There are many studies, which say that the copper is dependent on many factors and that the demand and supply factor is less than 1%.
CM	But isn't something, when talking about large volumes and copper, is it something that we need to consider that the price goes up and how it does impact the feasibility of the solutions?
MB	But then, again there, you will always have to consider the rest value. That copper at the end of its service period still has the same value, and most of the time it has a higher value than it was purchased. Copper can be recycled, let's say almost 99 to 100%; if you can collect it and bring it back etc. etc. So I think we should consider copper price form the let's say first use principal, but when considering on the life cycle, it is only the processing fee. And the processing fee, to give you an idea, is about 190 dollars and the copper price 6.700 dollars. So if it is possible to bring back copper to the smelter, which takes time and money and I won't say that that goes easily, but that process is already going for the past 20 to 30 years as compared to steel or some other materials. The recycling is processes on the day. And regarding the scarcity of the material, it depends only on the price. If you increase the price, what has happened one year ago, to 8.000 dollars, there were so much investment done in mining that now there is so much supply that the price has gone down. So this is the same with oil, with steel or another material, I think that we can conclude that this is the economic cycle. And this is why other studies by the European Commission including DG Enterprise and DG Energy are saying that copper is not a scarce material; but this doesn't mean that we should throw it away, but use it consciously.
PVT	And what is also of influence is that copper relies on international factors
MB	It is internationally priced, so it is the same price all over the world. The concentrates are coming from 30% from Chili and another 30% from a group of countries with Mexico, Peru, Indonesia and 2 or 3 others. The European copper availability is less than 2 or 3% in total: in some extant it is from Bulgaria, Serbia, etc. Russia is an important producer of copper. If the availability of copper will be become important than at the same time our export will be an influence factor, because copper is used in almost everything.
BS	In Belgium, there is a big smelter as well. I've seen copper being recycled and if you only need a few percent extra copper per year, taking into account recycling, than the prices will

	shoot out an extra percent...
CM	The price of copper fluctuates a lot, so it would have a major influence...
BS	If you look at the growth rate of copper of 1 extra percent per year, the rest of the year will always...
MB	The fluctuation of copper may affect the investment...
CM	Yes, exactly, if a building company is looking to invest in solutions in the cross sectional area that he normally could choose, but he only can choose solutions that double the cross sectional area and the prices are high, that could cause serious issues. It just seems to be something interesting to be look at in the sensitivity analysis.
DE	Yes, we have it in Task 6.
PVT	Yes, in our sensitivity analysis in principle scrap value is equivalent to a lower cable price.
MB	One more comment: 30% of the copper consumed in Europe comes from recycled sources. Also within in our company, all the copper we produce, depending on the site, between 10 to 100% is from recycled sources.
CM	What is the recovery rate of copper in buildings, for example in cases when circuits are replaced or a building is demolished, are all circuitry being removed?
LPS	The recycling rate of building is higher than 95%. I can assure you that all the copper in a building is taken away.
DE	In the Ecoreport tool, the value used is 95%.
PVT	We used pessimistic figures on recycling, despite the comments we have received. Because we think that at the end some of the copper in building scrap will end on landfills. We can discuss whether it should be 95 or 99%, but this won't make the difference, we need to be realistic. At the moment cables are even stolen before they are installed, which isn't also in the model of course.
LPS	When you buy a house or a building, you make an investment and you invest in de copper cable that is there. The price of copper refined , as any other commodity trade in the stock market, fluctuates, however the differences in price between copper scrap from cables (high quality) and copper refined are to some extent constant over time. When making an investment in your house as a consumer, you're investing in cables but also in a recovery that will come in the future, if this is not for yourself than at least for society. So we need to have a broader view: what is the initial investment and what is the recovery for society.

abbr.	Comment/answer
DH	In terms of your base cases: how much of the cable markets does this study cover regarding installed and purchased? Is it something like 20% of all installed cables? Do you have a number? If copper cables in Europe are e.g. 50% of the copper usage in Europe then if the policy measures would double the copper usage for 20% of cables that would increase the copper usage of Europe by 10%, which would be significant. So it would be interesting to see as well how much of the copper market we are expecting to affect.
PVT	The impact on the share can be calculated.
DE	In Task 2, there is a section on how much copper is sold in Europe and how much the estimate is for cables.
FN	According to the comparative study, the base cases of 2010, the BAU scenario points at 374 kton conductor material. This has to be compared to 4.5 million tons product market in Europe: cables only represents 8%.
MB	I don't know from data if it is 50%. Based on my market knowledge, in total electrical applications, everything included, will still be less than 25%. Of which copper is just a small part.
DH	The European Copper Institute said that it is around 8% for cables.
PVT	We can more or less deduct it from our figures and it is rather like 10%, so this isn't the

	majority of copper installed for this application. If we double it, this won't have that big of an impact.
FN	We are talking about cables installed in buildings, however the complete power cable market is much bigger, as it also includes utility cable, among others.
PVT	What we've seen in the annual reports of the cable manufacturers is that the cables we are talking about are estimated as one third of the turnover and the biggest is 5 to 7 billion worldwide and the European share is part of that. In Task 2 we have also included references and our analysis of the most important annual reports. When we compare our figures, we think that they more or less fit. So we cannot say that that amount of copper cables, 5-10%, is an insignificant part of the turnover of those companies.
MB	If the average consumption per capita in Germany becomes the European average, it will double. The amount of copper used in Germany, is I think 15 kg per person. The European average is less than half, about 5-7 kg. So, the copper usage in Germany, if going van 15 to 30 kg, of course will have a bigger impact than let's say for Bulgaria where than it will goes from 3 to 6 kg. So we need to be careful with the general assumption that it will double for whole of Europe.
PVT	In Task 2, there is an overview. Table 2-7 gives more data on this, which confirms this more or less.
DE	Yes, when looking there, you can see that cables for low voltage energy, it is about 1,000 ktons and the total is about 3,000 ktons, but this includes Russia and east of Europe and more than just in buildings.
PVT	So the figures are there and we can come back on the impact in Task 7 with reference to Task 2.

Task 3 (PVT)

See power point presentation.

abbr.	Comment/answer
MB	A question on slide 24: these end-of-life parameters are for the whole of Europe?
PVT	Yes
MB	Because in some of the east and south European countries, the recycling rate in general is much lower compared to Flanders, but I think it might be realistic.
PVT	But even then, it must be realistic in our model. We have a lifetime of 25 years, so it will only have an impact in our model after 25 years. These figures are applied only in our study 25 years ahead. We cannot know what will really happen at that moment. So, we might be pessimistic. Normally, in all studies of this kind the actual figures are applied, but of course the habits of people might change. So when implementing a policy measure regarding the end-of-life of cables installed today, the impact will only be over 25 years. So there is plenty of time to work on the recycling of cables. We can make recommendations on the recycling of cables, if there are ideas on that, but this is relatively outside the scope of this study focusing in new products brought on the market. In our study we have made reference to the study by the OVAM, also on recycling of insulation materials of PVC-cables. But on other cables, like flame-retardant cables, there is no data on the recycling. We can recommend studying more on the recycling of other cable insulation materials.

- **Tasks 4-6, based on updated input incl. improvement options and sensitivity analysis (PVT/ DE)**

Task 4 (DE)

See power point presentation.

abbr.	Comment/answer
JP	One comment [on slide 30]: this is not due to the fact that you use DC that it will improve, because if you do the same with AC, it will be the same. What happens is that you will increase the voltage, and then you can use AC or DC to get the same results. SO in my opinion the comparison you take is not fare.
PVT	Yes, but the point is on the insulation material. People regarding insulation material say that the insulation is fixed by the peak voltage and that it is always higher in AC than in DC due to the alternative current.
JP	Yes, but you are only taking one part of the problem, which is insulation, and then you take the conclusion of that one part and apply it to the whole, saying that the whole building will be far more efficient. In my opinion, mentioning it in this way isn't fair. Today we do not see a big advantage of DC on AC; this is only due to way the current is used. For example, it is comparable with using gasoline or diesel in a car, it doesn't improve the efficiency.
PVT	But we say, on system level, the impact is bigger, because you need switches and with DC it is more complex to interrupt the current due to the arcing problem. So in our text we also say that is more complex to switch from AC to DC and that it isn't easily. It's an ongoing research, which is done in the US, where they are doing it for lighting.
JP	Yes, but the problem for the US is that they use 110 AC, so in comparison the impact is much bigger than in Europe with 230 volt.
MB	Is this so widely spread that you need to mention this?
PVT	No, but it is only to mention something. This is the only BNAT that we know of that we can mention.
DE	But is commercial there.
JP	Yes, we know that there is some experience with this. But once again, if you increase, do the same with 400 volt AC you will have exactly the same results. Therefore, I do not agree with this.
MB	I think your statement can be added in addition.
PVT	It is mentioned
JP	For me it is not DC, it is the voltage and if you increase the voltage, than I agree, but do not mention DC or AC.
PVT	No, but we think that with the same amount of insulation around the cable, you can in DC use it for a same safety level...
JP	No, sorry, it is not DC; it is really linked with the voltage, so increase the voltage...
PVT	Yes, it is with the voltage, but the voltage in AC for insulation is peak voltage and not the RMS voltage.
JP	Yes, but we have a good example when we move to project normally; we would use 400 volts AC when it repays. When we move to projects, to design, to improve the efficiency we would move to 690 volt. And then you improve the efficiency, but it is really the project, and most of the times the technology isn't available and we have exactly the same problem. Except when you replace the copper by silver or gold, but economically it doesn't make any sense. And this is exactly the same, so we know that there are other technologies. But today the costs of those technologies aren't good and actually if you mention increase of voltage, I would agree, but not changing the type of the current.
CM	I've thought with DC that there are advantages with power factors as well.
JP	Yes, but it is totally different, because you also need a lot of convertors and when speaking of using DC voltage, like in your computer, there are probably 12 different voltages and needs a convertor for each. Once again, it is really something complex that is not liked with AC and DC, when you increase the voltage you decrease the current, which is the flow in the cable then you improve the efficiency.

PVT	We going to keep mentioning this in the report as a reference, it is a reality; companies are bringing related products on the market. For example, Philips and ABB...
JP	For sure, there is some technology; once again I don't say that it isn't one. But this can either be done in AC or DC. On one of your first slides, you mention new technology, but this not new technology and not linked with issue of AC – DC, but it is linked with the voltage, a higher voltage. It's the same with lighting, maybe in the past 12 volts was used and moved to 25 volts, by increasing the efficiency of the system and not linked with the fact...
PVT	No, but it is linked to the voltage and as far as I know, the maximum voltage in DC is always higher than in AC in RMS. Maybe you disagree with this, but this is what I've found in the catalogue. What we are saying here is that the RMS voltage for a same cable is always lower as the DC voltage.
JP	Yes, but in this case, we also need to speak about the problem of insulation, when you are in DC...
PVT	Yes, that is what I've been trying to say.
JP	Yes, but the magnetic field is always in the same direction, so the insulation will be destroyed more easily resulting in a higher frequency of cable replacements, far more often than AC. I don't say this isn't the truth, but it is just a part of the truth.
PVT	I think it is broader and very difficult problem...
JP	Yes, and this is where I'm not comfortable...
PVT	But this isn't important here....
JP	Just say that it is an example, but don't say it is at the top.
PVT	This is just the PowerPoint, please read the text in the report; we have reformulated.
JP	Yes, because once again, if you move to DC, there will be a problem regarding safety. When cutting an installed cable, there will be a fire.
PVT	Yes, the fire risk is higher.
MB	The last sentence on the slide [# 30] also says "Therefore it will not be considered as a viable BAT improvement option."
CS	Please document the stakeholders' views and move on.
PVT	Yes, and if you have articles, please send it to us and we can refer to it. Critical views are certainly welcome, as the articles of the EMerge Alliance are mainly commercial documentation and overly optimistic. Important aspects that we can use more information on are on arcing, the difficulty to interrupt currents in DC, and safety and fire hazards.

abbr.	Comment/answer
HM	It is mentioned several times that the insulation cycles should be different between AC and DC. In the tables of the cable standards, you will see that all the small sizes with the same insulation cycles, is not because of safety, but is because of mechanical reasons to produce such a cable. So all the low voltage area has a cycle due to the ability to produce this layer with regards to safety.
PVT	We can mention this, while it is less relevant. More criticism on what we have found in the literature is welcome.
HM	There is a lot of discussion in AC on usage of DC.
PVT	Yes, we have also seen it in the literature. Therefore, I think we need to keep it, as we need to avoid loopholes in legislation, if legislation is only made for AC. This is the main reason to keep this here.

Slides 31 and onwards on Task 4 only present what is changed compared to last meeting. For the full text please consult the report (see documents on www.erp4cables.net).

abbr.	Comment/answer
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CM	A question on the design options, it was mentioned elsewhere that changing the design of circuits it should reduce the losses as well, but this is not considered as one of the options.
DE	It is not considered as an option, because it is on system level and it is the design of an electrical installation. But is in the sensitivity analysis: what will be happen if you have longer cables, so it is considered there.
CM	Another thing as far as the options go; it seems that the technology options focus on the energy side of things. Are materials aspects such as the insulation not considered? Is there an intention to add that?
DE	We have considered materials in the next tasks. You will see that we have looked at it with the impact parameters of different solutions. But we did not look at an improvement option when you have a different kind of insulation. We also hadn't seen more information on this in the study of OVAM. The main thing is that we don't have any data.
PVT	The first thing is to produce the outcome and then we can see what the relative impact is of insulation material. But in the study of OVAM also didn't point out any new manufacturing techniques or materials, only some rough mentions.
BS	Yesterday, I've seen some data on television recycling and what we saw is that the recycling of plastics is very complex due to the many different plastics and different flame retardants. I don't know if it would be possible to have a simplification in the materials used, because everyone uses a different flame retardant in PVC that is incompatible.
AS	I can give a short reaction on this, there isn't much but there is some experience with the recycling of plastics. Technologically a lot is possible, but in many cases it is an economic issue due to the collection of small volumes of plastics. Also in general, secondary material contain a lot of contaminating materials in it from the splitting and then it is costly to make the plastics suitable for recycling. So in many cases it is an economic issue as well as the absence of a good market for moulding products, as mixed plastics in general can only be used for moulding products.
CM	So, is it something that can be assessed as an option?
AS	Yes, we should look into it further, when relevant.
HM	When talking about recycling, I think it important to mention that due to safety reasons it is not possible to use recycled materials as an insulation materials.
AS	Yes, it is always downgrading.
HM	So, when a cable is separated, you will have copper parts and some kinds of plastics. You have to separate them to get the copper, and the remaining plastics are being used for producing bumpers or something else. Is this the kind of recycling you are talking about?
ML	We can get contact with the contractor of our study to get more information on the end-of-life.
PVT	Yes, we have read the study but it wasn't detailed enough, it rather confirmed what we already had on that standard materials can be recycled. But of course if we can get more details on the composition from the manufacturers, that would be better. Also it is not documented which fraction of PVC is recycled. Another issue is that the currently used cables are apparently recycled according to your documentation and it is technically possible, but there are also halogen-free cables on which we have no documentation of on how they are recycled. In our study, this is only recommended as something for further research.
AS	I can confirm that there have been internal studies on the product waste, where the plastics are still in the process but contain already some of the materials mentioned in the table. Then they can be recycled and used in the process again. Whereas at the end-of-life, the plastics have contamination in it, as where HM was talking about, and that's the difficulty. So it isn't the material itself, it is the EOL material.
MB	The word recycling should be used more precisely: is it upcycling, used in the same purpose,

	or down cycling...
PVT	We followed the MEERp methodology and in the method there is no closed cycle philosophy in the sense that the recycled products are used in the product itself and that there is a bonus for this way of calculation. Of course, this is a general point of discussion and copper could be used in plumbing or in cables/
MB	For example, recycling of this mobile phone, if 98% recycling of the copper can be achieved this would be very good, because for the remaining 2% the costs will be very high.
ML	I think that in our study it was concluded that is possible to reuse the plastics into new production of plastics for cables.
PVT	Yes, but it wasn't concrete in which kind of plastics we should use as filler material. It is a general idea.
MB	Well the point is, that we can make recommendation that it should be promoted etc.
PVT	If they are available, such precise recommendations could be included in the study...
ML	The recycling cannot intervene in the production phase...
PVT	Yes, but it is possible to make products that are more easy to recycle, by using another compound for insulation material.
ML	I understand this is an important topic, but as I saw the core was about cables installed inside buildings and the energy losses.
PVT	Yes, and there are other directives on this such as the EPBD
CF	Well, the EPBD is not good here. This study should be more than only based on energy.
PVT	This is something that can be addressed.
MB	It can be taken into the recommendation.
PVT	What you can find in our findings is that in certain applications it is indicated that it is important to look at it.

Task 5 (DE)

The main difference with the previous version of this task is that we now have 9 base cases instead of 5.

abbr.	Comment/answer
SB	Question on slide 38: only copper and aluminium is used as conductor materials, but is not there also a type of conductor of copper plated aluminium?
AS	No
PVT	You can find it in loudspeaker cables for some commercial applications, but not in buildings.

abbr.	Comment/answer
MB	Shouldn't you consider some rest value and how? The prices are always higher than at the time of installation, it never has gone down. It can be significant when you are looking over a 10 or 30 year period. Also as the Commission always distinguish processing costs and material costs in their discussions.
DE	I'm trying to remember if it is in the Ecoreport tool.
PVT	Probably, there is a scrap cost. We can do a check and if it isn't we can add it ourselves.
DH	Isn't that a bit irrelevant? As cables are basically being replaced by thicker cables instead of thick cables being replaced by thinner cables.
MB	In this case what I mean to say is that there is no money allocated for rest value. It had some value and usually is increased. So if conservative estimates are taken for the existing value, than it is more realistic to also take a rest value. Or installation based value.
PVT	If a less efficient cable is replaced than there is a benefit, but this would make it even more complex. Keeping a value at the EOL is probably the simplest thing.
DE	I was also thinking about who is doing the investments, is it the building owner? And who

	gets the rest value of the copper?
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abbr.	Comment/answer
JP	What do you call connector cost?
DE	Using a connector in a circuit, having a connector.
JP	Without protection, or an outlet? Because there are things that need to be kept in mind when the section is increased, like doubling the protection. And the size of the circuit is limited if a second outlet is added. Just keep in mind that there are limitations.
DE	We have qualified this somewhere in the text, by speaking about extra circuits or outlet.
JP	Okay, so you are aware of this issue.
ES	So, does this imply that all what is installed behind the cable will be more expensive, because of the use of a different section? Knowing that the residential sector is 75% of the building stock, did you do the exercise on the return of investment of an electrical installation that an installer has to sell including the changing of the cable and the benefit of the energy savings for the owner?
PVT	We do not focus on the residential sector, to be clear; we mainly focus on the dedicated circuits that are well thought and well installed. There it is mainly having enough space and the possible issue as just explained on the protection device that needs to be changed when circuits are in certain levels and ranges. In principal, a proportional installation cost will increase in our model. When going to a bigger section the installation cost will change proportional.
DE	Due to the outcomes of the first screening, the residential sector was excluded in Task 1.
PVT	In the residential sector, or in sockets, or in lighting, it might be very difficult to do this. In other circuits where we are focussing on, it is quite common to select certain CSA, and change the whole range with certain prices.
ES	Well, the question remains the same, even if you don't consider the residential: the return of investment between the investor, occupier and the installer; how can an installer sell this, what is the benefit?
PVT	This will be show in Task 6.
DE	What we have seen in the responses of the installers on the enquiry is that when selling an installation, only the investment is an important aspect for the customer without looking at the long term or the ROI.
PVT	None of the installers indicated that he convinced a client to choose a bigger CSA. So we don't have evidence or examples that a client asked for a bigger CSA than required by the safety standards.
JP	Want to comment that cables are already oversized at the moment. I don't know what you concluded in Task 6, but the conclusion can be that there is no need to increase the CSA further as it is already oversized. In the case of the industry sector this is different where the cable is optimized.
PVT	Statistically this is confirmed by the cross checks, that most of the cables as you say are already oversized. For a big part of the cables your statement is true. In our findings we saw that when the load parameter is taken as a median for the calculations, we end up with a number for the energy used that is much higher than the energy produced in the EU.
MB	I think this is normal, probably the safety standards refer to the peak value, resulting that the average value is much less.
JP	It's just an optimization between safety, energy efficiency, manufacturing and so on, so it is just a combination of all these factors than just only one.
MB	I'm also participating in the European Commission group on energy efficiency financial institutions, there is said that there is 50% potential in buildings and 50% in the industry. And there the issue is that what we design today will determine the lock-in effect for the energy

	efficiency. So I will support you to consider the energy price, although it is not realistic at the moment as in some places it is said that the price is too low and in other too high. At what time will the installer be considering the energy price in its operation?
JP	This is what we've included also in our standard, to check especially for commercial buildings that the way a building is used will evolve in time and the building in time can remain energy efficient.

abbr.	Comment/answer
DH	Suggestions for a cross check: the amount of fixed copper sold in the EU has been constant since 1980. Try to figure out if the stock has been growing with the same rate. This is a linear growth not an exponential.
MB	The following nuance has to be made on that: the copper usage in western EU before and after 1989 was around 1.9 to 2.0% at the most. Whereas in the eastern EU, the usage has doubled. So you need to be careful with taking an average growth for the whole EU.
PVT	We have the feeling that with the cross checks it is already done; we have the right order of magnitude.
DH	My suggestion is more for the projection of usage over 30 years.
LPS	I would like to clarify: we can give EU-27 data for your assessment, but this is not 60% but 80%.

Task 6 (DE)

See powerpoint presentation.

abbr.	Comment/answer
MB	Why are 'heavy metals' mentioned in this discussion [slide no. 61]? I thought we only had copper and aluminium.
DE	No, this is one of the standard indicators of environmental impact that is calculated by the Ecoreport tool.
LPS	Want to mention that this great that this indicator is included in the assessment, but it should be taken with caution and for a hotspot analysis this is alright. Because there are a lot of discussions on the method behind the assessment of this indicator and is not as strong as other indicators.
MB	I think a footnote will be useful here.
DE	In the report is mentioned that the Ecoreport tool and the MEERP methodology are used.
PVT	We can add that this has to be studied more in detail as a research recommendation.
LPS	Even with the other indicators and the graphs with the results per phase, it should be mentioned that the results need to be taken with caution. Because the Ecoreport tool is used and that isn't the best LCIA-method.

abbr.	Comment/answer
AS	What exactly is included in the production phases? Plastic, copper, from raw materials?
PVT	Yes, it is not only the copper. So the complete production of materials, including the transport and packaging, etc.

abbr.	Comment/answer
MB	What's the unit of the graph on slide 64?
DE	In the report, in the caption of each graph the unit is mentioned.

abbr.	Comment/answer
MB	On slide 67, again the rest value is not included yet. If added the simple payback period will be less. In other studies, it was recommended to keep the materials within the EU for recycling, urban mining, etc.
PVT	We will certainly mention this. We can add there is a strategic stock, making us less depend on other countries.
MB	Recycling of plastic and other materials can have also a rest value and not only used for energy production. However, this will make it more complicated.
DE	We have to see if it is possible to add it into the Ecoreport tool.

abbr.	Comment/answer
CM	[slide 70] The product price is it included in the sensitivity analysis? Or something you are going to do?
DE	Yes, to see the impact on the life cycle cost.

- **Continuation after the lunch break: draft Task 7 - policy options, scenario's, socio-economic impact analysis and sensitivity analysis (PVT/DE)**

See powerpoint presentation.

abbr.	Comment/answer
ES	Just to complete you with regards to the losses [slide 78]. I know in certain countries, national associations have developed tools to calculate the losses, such as Norway, Switzerland, probably the UK too. So it can be used to calculate the losses directly, just by giving the right parameters.
PVT	Yes, we've seen that and some manufacturers referred to it.
ES	It is not manufacturers. It is the national association of installers; developed, maintained and managed by the association itself.
PVT	That's nice, we can add this.

abbr.	Comment/answer
PVT	Another thought is on ohmic resistance.
HM	You stress ohmic resistance, which is really fine. All the tables in the standards give the ohmic resistance in an easy to express name, for example 50 mm ² . Do you think that the value of 0.187 ohms per km is helpful to decide which kind of connector you have to use, or kind of fuse?
PVT	Indeed, from practical point of view for mounting the CSA is better.
HM	Is the DC ohmic resistance helpful? And the maximum load on 20 degrees is het really running at 20 degrees? The ohmic resistance is needed at the maximum temperature. And only then a 100% load can be given.
PVT	Any ideas on this are welcome. It is not to replace important information as the CSA. It is just for having more easy accessible information.
AB	I have thought about this concept. First, the resistance needs indeed to be combined with the cross section. Then, resistance at 20 degrees or at maximum temperature; it would be better at maximum temperature, but in this way you will put high-performance insulation in a disadvantage. So in my opinion 20 degrees is acceptable for everyone. When making the dimensional analysis of resistance, you will discover that resistance is watt per m per amp. Therefor my crazy idea is not to provide resistance, but the same value but expressed in terms of watts per unit of length per amp, which allows the comparison of all

	cables in quite a communicative way on the same level.
CM	I think it is useful to move away from the focus on CSA, when you start to think about energy efficiency and reducing losses. If you look more at resistance than you could have more technical solutions to achieve that way, e.g. an aluminium cross section and such and such. This will encourage a more holistic viewpoint when specifying systems.
MB	I think that we can have a combination for a transitory period. It is for our group to decide how we can achieve the objective energy efficiency and which parameters to use and which path to take.
HM	Sorry, it is different. A lamp or a final use appliance is the end of the whole chain. The cable is something in between that needs clear communication with all electrical parts to which the cable is connected. So for installing the cable it is important to know what the connection points are.
MB	How else can you motivate a designer to think about the energy efficiency of a cable?
CS	It will be highly unlikely that the Commission will propose an Ecodesign regulation with information requirements only. The normal way around is that you have hard requirements on energy efficiency that makes economic sense and then you can think about information requirements on top, which don't have to make economic sense per se as there is already regulation.
PVT	Okay, please provide use ideas.

abbr.	Comment/answer
CM	In case of the application of minimal energy performance, it doesn't need to be focused on a ban, for example of small CSA. It can focus instead on the losses in installed circuits, e.g. all industrial installed circuits must not exceed 5% losses. So rather than focussing on CSA, you focus on performance of a circuit.
PVT	Yes, this maybe can be combined with the idea on information requirements.
CS	Even if we stretch the limits of the Ecodesign directive to that extend, we would be challenged by the free movement of goods. What would be the case of harmonising that on EU level? Which I can't see.
CM	Another option is the adoption of voluntary agreements. To avoid the regulatory issues on a flexible way.
CS	Who would be in charge of that? The European installers' organisation?
PVT	We can add this idea.

abbr.	Comment/answer
BS	If the definition of 'a product' would include services as well this could make a difference. So that the installation can be included as well. In Ecodesign I think only a good is a product, which is different from standards that refer to a product as a good as well as a service.
CS	Let's imagine if we consider regulation, on whom will the legal obligation be? Who has to design for energy efficiency? The installers, the architect?
PVT	Every country can decide for each self. There is also no decision yet that this should be decided at European level.
CM	Another in Ecodesign is energy labelling. Is there an option to label circuits?
PVT	A possibility is to include it in the EPBD.

abbr.	Comment/answer
FN	Should the legal obligation be on the one who makes the calculations?
BS	But the installer can install something different than what was designed.
PVT	In principal, the installer is the one who brings a product on the market. He makes the final delivery to the end user.

MB	Can't you make the one who is responsible for the safety also responsible for the energy efficiency?
PVT	In some countries that is the case and the certifier has the final responsibility. But what about the manufacturer? We need to state in the reports who are the responsible parties and what does it imply?
CS	There is an additional complication. The requirement cannot be verified in the product itself, making it hard to rely on self-certification. Meaning that you need third-party certification and increase in compliance costs, which is difficult to convince Member States.

abbr.	Comment/answer
CF	It's interesting to have analysis on how the EPBD can help, but little legitimacy to do so, as the point of this study is to see what can be achieved with Ecodesign and not to shift that to EPBD.
PVT	We are bringing up the idea.
BS	To confirm, is it that we cannot do Ecodesign because we cannot discriminate between professional cables and household cables? Meaning that lower CSA cannot be band?
PVT	Yes, but there are always applications in the industry sector that uses small CSA too.
CS	In the power transformers study, we had a similar discussion. Where we came to the conclusion that the best way forward was to make TCO embedded in their tendering processes mandatory for utilities, as each transformer has unique design specifications. This was agreed on by all, but this isn't something that can be done with the Ecodesign directive because it is addressed to manufacturers when they place products on the market. The question is, in the transaction between the one who designs and the one who installs the circuit, how can we make sure that they take into account energy efficiency over and above safety? The transaction governed by private law, in contract, so maybe the best way is not by regulation. Will the standard alone suffice to make sure that energy efficiency will always be taken into account?
ES	I think it all depends on the client.
CS	What drives the award of contracts? Is it purely on costs? Or is the one who puts the contract out requiring that energy efficiency is taken into account? Is there a driver for this?
ES	Installers will respond on the demand. It is not requested. More and more technical solutions on the field of energy efficiency are done, but not automatically. On the other side, there are already energy-efficient technical solutions that are proposed to the client. The rest is negotiable between price and the willingness to invest in technical solutions.

abbr.	Comment/answer
BS	For plastics, if you manufacture a cable how many plastics, flame retardants and other additives goes in there? What does it depends on?
AS	I think this is out of the scope of this study. Therefore we did not provide any detailed information on recycling.
CS	The question is, is there anything that can be on regulation to improve the way cables are recycled?
AS	No, as already explained, the copper value is very high. So as soon as cables come available on the market at the EOL and they are collected, the copper will be recycled. Resulting that the plastics come available as well. But only if there is an economic viable way to recycle the plastics, than the plastics will be recycled. This also depends on the type of plastic market, who the recycling is organized e.g. PVC is very well organized. But it will not always go to a recycling company.
BS	Can a manufacturer easily switch day by day which type of plastics it uses?
AS	No, it is well specified.

BS	Is it then possible that manufacturers only commit to using only one type of plastics?
AS	No, that isn't possible, due to safety issues and fire resistance specifications. It depends very much on the specifications of the customer and the applications of the cable. But the problem with EOL recycling is not only the substance of the plastic itself, but also the contamination by the shielding of the cable when splitting the cable.
CS	So the only secondary use of plastics is downgrading?
AS	Yes
CS	Is there anything that can be done at the design stage of the cable without compromising the properties of the cable and would prevent downgrading?
HM	No, there too many causes. If the insulation material is used with a chemical modification of the properties, for example heat treated to get cross linked for certain mechanical strengths, than the material cannot be used again. It cannot be extruded again. Another material, the volume of it is too small.

abbr.	Comment/answer
CS	We need a better characterisation of different policy options. Not with comparing labelling with labelling, and BAU and Ecodesign. Go deeper into the characterisation of the different policy options. It isn't up to you to decide whether or not to go for Ecodesign. Putting that a side, what would be the savings with an Ecodesign scenario?
PVT	Yes, indeed. But we can also use your feedback on the options. The first step is to identify the presented policy options better, followed by how they are linked to the scenario. Of course, the weaker options will always have uncertainties whether they will be implemented.
CS	You have been through this before in the transformers study.
PVT	With the transformers we were surer on the loading.
CS	Just make assumptions and document it.

abbr.	Comment/answer
CS	What the directive says is that the requirements should be set on the level of least LCC or similar, so the magic figure we need is the difference between BAU and the least LCC. Whether it is feasible or not, that is a separate question, and whether that can be archived with the Ecodesign directive is a different question. But that in itself has a lot of value, when we are talking about half a TWh than we can go already, when talking about 50 then we're talking.
BS	That is why I was wondering why you didn't take for scenario IV: the Ecodesign scenario, D3, BAU, leaving BC 2, 3 and 6 out.
CS	There is potential but difficult to tap.
BS	Slides 81+82 on policy options are to unclear.
PVT	Yes, the options were not linked but will be more commented in the final report.

Conclusion of the stakeholder meeting: the policy options needs to be reworked and depending on that redo the rest among which the sensitivity analysis.

- Any other business
- **Planning stakeholder feedback and finalization (all)**

Deadline for stakeholder comments, input and position papers: Saturday 20 December 2014.

