DG ENTR Lot 8: Ecodesign for Power Cables in Indoor Electrical Installations

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1.	Task 1 report	All	All	General	The transparency and reference of data used needs to be improved	All sources and data should be shared among stakeholders. We would recommend using publically available data source such as MEErP methodology Part 2, as well as EUROCONSTRUCT and EUROSTAT data.	Data will be shared among stakeholders, unless they are confidential . We use publically available data
2.	Task 1 report	All	All	Review	Provides lines in the document to improve the list of comments	Add lines on the draft document.	Accepted Changes to the text will be marked by a green background
3.	Task 1 report	All	All	Review	The title on the top of each page is “list of acronyms”	Modify the top of pages of all the document	Accepted – Removed

4.	Task 1 report	List of Acronyms	VI	Acronyms	Not all acronyms are listed. For instance, kd factor is not mentioned. Moreover, some acronyms can be used for two different words (S)	Review list of acronyms : -by adding the missing ones - by replacing some of them so that one acronym cannot be used for two different signification.	Accepted Added Remark: "S" is used for Apparent Power & for the nominal cross sectional area of a conductor (this is also the case in the standards)
5.	Task 1 report	Chapter I	9	Summary	The scope is mentioned to be "losses in installed power cables in buildings". Considering that cables consume energy depending on the way they are installed and on the final application they are connected to, the scope should focus on the "installation system" and not on "losses in cables" We do recommend to switch the scope from "losses in installed power cables in buildings" to " electrical installation system in buildings"	Review the scope of the study	Partly accepted: We will take into account the whole electrical installation. But as stated in the Work Plan, the main focus will be on the fixed wiring because this is the most relevant element of the electrical installation for energy efficiency purpose.
6.	Task 1 report	1.1	11	Highlighted sentence on energy systems	For power cables; the installation system is entirely affected by the choice of the power cables. Installation system should be included in the scope also. See above the recommendation on scope modification.	Review the scope of the study	Partly accepted: Installation system, ambient conditions… do have an impact on the cable section. This is already mentioned in the study.

7.	Task 1	1.1.2	14-17	Scope	Norway : As IT-systems for 230 VAC installations are valid in Norway, more screened installation cables are in regular use = safety aspect (National Product Standards. NEK 535, 591 and based on CLC 603, 604, 627, EN 50525)		Accepted Added in the text (on page 16)

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8.	report						
9.	Task 1 report	1.1.2	15	Insulation description	It is mentioned that the insulation of the cable is made of an insulation of the conductors and an outer insulation sheath. The outer sheath has no insulation purpose. It is thus not called "insulation sheath" but "sheath"	Review the cable description and differentiate insulation from sheath. Delete the word assembly and the last sentence	Accepted "Insulation" removed
10.	Task 1 report	1.1.2	16	Electrical losses	Cables losses are not called "copper losses". Such losses will exist whatever the material of the conductor, as for instance for aluminium.	Remove "or copper losses".	Accepted "copper losses" removed
11.	Task 1 report	1.1.2	16	Shield Fig 1-3	This is a commonly used cable in industries and residential buildings in Sweden	**Change to:** This is ~~not often~~ used in electrical power cables within buildings, ~~it is mainly~~ and used in instrumentation signal cables.	Accepted Changed (page 16)
12.	Task 1 report	1.1.2	17	Electrical installations in buildings	For the related installation and products the IEC standards 60364, 60227 and 60245 are mentioned	The relevant European Standards should be mentioned but information is also necessary, that there may exist national rules and products deviating from IEC or European Standards.	Accepted Added (page 17) *Please provide us more information about the electrical installation rules at member state levels, so we can add it in the report.*

13.	Task 1 report	1.1.2	17	Scope	Norway : NEK 400 is based on IEC 60364, but with National deviations, as for example requirement for bigger conductor cross-sections, i.e. 2,5mm² instead of 1,5mm², etc., with following downsizing of circuit breakers to take into consideration the relatively high electrical energy used for electrical heating by electrical ovens or heating cables, due to good availability of GREEN Hydro energy, and the fact that the losses in transfer of electricity is much lower than the losses using hot water as energy source. The minimum conductor- and short circuit breaker requirements are set due to less risk of overheated		Noted

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					cables/connection, which again could be basis for fires, not today to reduce energy consumption. Well thermally insulated buildings are the most effective way to minimize the energy needed for heating!		
14.	Task 1 report	1.1.3	19	Scope	As mentioned above, scope should be modify by “installation system”, to take into account the effect of the product on the all energy system (electrical installation), as mentioned in the methodology. Scope can not only focus on “losses” but should have a global vision, and thus concern a system and not losses. Moreover, the methodology recommend a global life cycle view, not to transfer pollution from one phase to another or from on media to another. It is recommended to use Life Cycle Assessment process with transparent data and methodology.	Review the scope of the study. The objective should be to minimize the environmental impact of installation systems by reducing electrical loses in installation systems but taking also into account all related adverse environmental impacts for bigger cable cross sections It should also take into account the total life cycle cost related to any potential changes of electrical cables. Carry out LCA and LCC analysis, taking into account the different life cycle steps and various environmental indicators.	Text added explaining that the electrical installation is taken into account at system level and a reference is added to Chapter 3 for more details on this approach.
15.	Task 1 report	1.1.3	19	Scope	The first two paragraphs do not have the same scope mentioned	Harmonise the two paragraphs with the same scope.	Accepted Done

16.	Task 1 report	1.1.3	19	Scope	The term "building" should be clearly defined somewhere. Are all buildings concerned, like Nuclear power Plant or Oil and Gas industry for Instance, which can be considered as an industrial building? In that case, additional standards for specific application should be added in 1.1.5	Provide a definition of buildings concerned by the directive or the list of buildings that are out of the scope. If necessary, complete the list of standards with the ones existing for specific applications.	Accepted Information added under 1.1.3
17.	Task 1 report	1.1.3	19	Scope §3	"or non-insulated " : Non insulated LV cables do not exist for safety reasons	Remove "or non-insulated".	Accepted Removed
18.	Task 1 report	1.1.3	20	"fixed wiring"	Both single core and multi-core cables can be installed in buildings.	Remove (single core) in the "fixed wiring" paragraph	Accepted Removed
19.	Task 1 report	1.1.3	20	Remark	The remark should mention that the word cables will be used for "power cables"	Add "power" in the remark: "...as a general term for insulated *power* cables...."	Accepted Added

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20.	Task 1 report	1.1.3	20	"Outside of the scope" §1	The potential increase of cable cross-section will induce : - Higher energy consumption for conductor, insulation and sheath as well as packaging - Higher transportation impact due to higher product and packaging weight - Higher energy consumption related to end of life.	Include the other life cycle steps to be reviewed as modification of cable size will have a negative impact on them.	Noted This is the purpose of Task 6.
21.	Task 1 report	1.1.3	20	"outside of the scope" §2	Lift cables and safety cables are mentioned as outside of the scope. A definition of lift cables and safety cables should be provided as they are part of the electrical installation system.	Provide a definition of lift cables and safety cables that are out of the scope. It may be also the place to exclude specific buildings (e.g. NPP)	Accepted Added in the text: "In general these are special purpose power cables which are not fixed wired (flexible lift cables) or have very low load currents (cables to fire detectors, data cables..)".

22.	Task 1 report	1.1.3	20	"outside of the scope" §2	"socket-outlets, junction boxes, cable installation system, ..." are mentioned as outside of the scope. Considering the negative impact of the proposed policy measures on the installation system, such part should be included in the scope	Include the installation system in the scope OR Include this line "socket-outlets, junction boxes, cable installation system" in the paragraph above to ensure that the negative impact of the proposed policy measure on such equipments will be taken into account.	Accepted "socket-outlets, junction boxes, cable installation system" included in the paragraph above
23.	Task 1 report	1.1.3	20	"Outside of the scope" §1	The building construction should be mentioned in this chapter. Any modification of the cable diameter will have a negative impact on the building design.	Include the building design and construction on the list of topics outside of the scope but with negative impact related to the proposed policy measures. "	Accepted Added
24.		1.1.5	21	Categories	Cable classification and IEC responsibility is slightly different	IEC TC20 WG 17 is in charge of LV cables (below 1kV). 1kV cables are in the responsibility of WG16	Accepted Changed
25.		1.1.5	21	Categories	There are many product standards mentioned which are not relevant for fixed installation products	Delete references to products out of the defined scope (fixed installation), inform that there are also European and national product standards	Accepted Not relevant references deleted Noted
26.	Task 1 report	1.1.7	24	Functional unit	As mentioned in ISO 14040, the functional unit should be "quantified", to ensure comparability. It should include the current carrying capacity, as well as quantification of the product itself, the lifetime, use conditions, and standards the product fulfils. The list of standards allows comparing specificity of identical cross-section, having for instance different fire properties.	Proposed functional unit for cables : "transmit energy expressed for X A over a distance of Y km during Z years and a W% use rate, in accordance with the relevant standards AAA, BBB, CCC , DDD"	Rejected FU= so called Single parameter. Length of the cable, use rate,.. are secondary performance parameters

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27.	Task 1 report	1.1.8	24	Secondary product performance	Lifetime should be included as a secondary product performance.	Add Lifetime as a secondary product performance parameter.	Accepted Added
28.	Task 1 report	1.1.8	24	Nominal Cross-Sectional Area (CSA)	Reference to US-standards AWG is not necessary		Accepted Standard added
29.	Task 1 report	1.1.8.1	25	Conductor Material : Note	Such alloys are not used in buildings application, so the note is not relevant.	Note to be deleted..	Accepted – Deleted
30.	Task 1 report	1.1.8.1	25	Number of core in the cables	The second layer is not insulation but a sheath. Is has no insulation properties.	Rephrase by using sheath instead of “2 insulation layers” and “globally covered by an insulation protective material”.	Accepted Changed
31.	Task 1 report	1.1.8.1	25	Number of core in the cables	Earth can also have smaller size	Add “earth” after “neutral”	Accepted Added
32.	Task 1 report	1.1.8.2	26	Electrical installation system	The short-circuit intensity is not mentioned. It is also a criteria for cable selection	Add the short circuit intensity as a criteria for	Accepted Added

33.	Task 1 report	1.1.8.2	26	IB	Does “IB” in the voltage drop paragraph and “Ib” in the lad current paragraph are the same? If yes, always use the same script for a given acronym. If yes also, do not used different words for the same acronym : “IB : Design current” and “Ib : Load current?”	Always use same acronym : IB or Ib Always use same definition : design current or load current Include Ib (or IB) in the list of acronyms at the beginning of the report	Accepted Changed
34.		1.1.8.2	26	Installation cable length	Installation cable length: the total length of cable used in the electrical installation as the sum of all circuits;	Misleading. To be clarify.	Accepted Clarified
35.	Task 1 report	1.1.8.2	27	V3	Does V3 in the equation means “cube root”?	Clarify the equation.	Accepted Clarified (Square root)
36.	Task 1 report	1.1.8.2	27	I circuit	Two acronyms are mentioned for the same definition : limit the acronyms to 1 per definition	Remove “I circuit.”	Accepted (Imax removed)

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37.	Task 1 report	1.1.8.2	27	Load form factor	Mention where this definition and calculation comes from.	Add the reference of the formula.	Accepted Added
38.	Task 1 report	1.1.8.2	27	Load form factor	Prms and Pavg are not defined	Add the definition and potential formulas for Prms and Pavg.	Accepted Added
39.	Task 1 report	1.1.8.2	28	Equivalent operating time'	Load current is referred as I(t); According to definition page 27, it should be referred as Ib(t)	Check the homogeneity of acronyms in all the document and formulas.	Accepted Changed
40.	Task 1 report	1.1.8.2	28	Loss load factor	The loss lead factor is not defined in the document. Add the definition and potential formula for the loss load factor.	Add loss load factor definition and formula	Sentence is removed as the loss load factor isn't used in the report.
41.	Task 1 report	1.1.8.2	28	Loss load factor	Mentioned "for the derivation of the loss load factor, in μ". What means "in μ"?	Check the sentence	Sentence is removed as the loss load factor isn't used in the report.
42.	Task 1 report	1.1.8.2	28	Power factor	PF is defined as the power factor. Power factor is already mentioned in page 27 as Cos ϕ. Is it the same power factor? If yes, use a single acronym for the same definition all along the document	Clarify the acronym to be used for power factor : Cos ϕ or PF	Accepted Cosφ is used
43.	Task 1 report	1.1.8.2	28	Power factor	Refer to the standard the definition and formula of power factor is extracted from	Refer to the standard for power factor definition	Accepted Standard added

44.	Task 1 report	1.1.8.2	28	Power factor	“Apparent Power (S-VA)” : No definition of apparent power nor S nor VA is mentioned anywhere	Add the definition (and reference) of apparent Power Explain what is S Explain what is VA.	Accepted Added
45.	Task 1 report	1.1.8.2	29	Conductor Material purity	Purity of copper and resistivity is fixed in standards.	Material purity is not relevant here as standard request specific conductivity (conductor resistance values)	Accepted Removed
46.	Task 1 report	1.1.8.2	29	Performance related to the use	The properties of the cable should be mentioned in this part, such as fire properties , oil resistance, halogen-free, ..., which are criteria for cables selection	Add the other properties of the cables, specified by the standards and that appear in their list of requirements.	Accepted Done

47.	Task 1 report	1.1.9.3.1	31	Table 1-4	The market data source of the table value is mentioned to be from European Copper Institute but no Publicly available information have been found on such data.	Provide the document on cables sales by ECI. Each time data are used, refer to task 2 report with clear information on source..	This chapter is a first screening. A detailed calculation will be provided in the tasks 4 till 7. Chapter 1.1.9.3 looks at the Working plan which is publicly available. The study on which the working plan is based, is now also publicly available. (http://www.leonardo-energy.org/white-paper/economic-cable-sizing-and-potential-savings). Extra reference to this study is added. This and following comment s on the first screening will be taken into account in tasks 4 till 7.
48.	Task 1 report	1.1.9.3.1	31	Table 1-4	Values for residential Industry and services are based assuming sales for (industry + services) = 1.5 times sales for building. Where this 1.5 comes from? Source? Once the 1.5 time applied, the ratio between industry and services is fixed and set to 47% for services and 53% for industry. Where this ratio comes from?	Provide more transparency on the table value, by using publically available information (or provide the reports), and by explaining and justifying the calculation methods when existing.	See comment above.

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49.	Task 1 report	1.1.9.3.1	31	Table 1-4	To calculate the sales of power cables for residential, an assumption of 30kg/household is assumed, whereas the 1.1.9.4 mention that the total amount of copper in the model is 25kg/100m² and that the average floor area for a residential building is 84m², leading to 21kg/hh.	Data source should be provided on total amount of copper per hh.	See comment above.
50.	Task 1 report	1.1.9.3.1	31	Table 1-4	If total amount of copper in residential area is used to calculate the kt of copper : - By using MEErP data on number of hh (204 663 000 in 2004) - By assuming 21 or 30kg of copper per hh This leads to - 4297 ktons of copper for 21kg/hh - 6139 ktons of copper for 30kg/hh So respectively –39% and – 12% compare to values for 2005 of table 1-5	Assumptions have a great impact on the conclusion. Provide transparency on assumptions, data, data's source and calculation method used.	See comment above.

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51.	Task 1 report	1.1.9.3.1	32	Table 1-5	Values for residential Industry and services are based assuming sales for (industry+services) = 1.5 times sales for building. Where this 1.5 comes from? Source? Once the 1.5 time applied, the ratio between industry and services is fixed and set to 42% for services and 58% for industry. Where this ratio comes from? Why the ratio between industry and services is different for sales of power cables and for stock of power cables? If ratio of sales is different for this two application and differs from the one of stock, then ration of stcoh for industry and service cannot be constant. Rk : on Chapter 6 of MEErp methodology , the main buildings types per floor area are : 51% residential, 31% tertiary and 14% industrial, which differ from proposed values;	Provide more transparency on the table value, by using publically available information (or provide the reports), and by explaining and justifying the calculation methods.	See comment above.
52.	Task 1 report	1.1.9.3.2	32	Table 1-6	The document referenced for table 1-6 does not provide the electricity consumption per application. It provides : - Final energy demand per fuel (solids, oil, gas, electricity, ...) - Final energy demand by sector (industry, residential, tertiary, transport) Where do the values in table 1-6 come from?	Explain where the value from table 1-6 come from and provide calculation used.	See comment above.

53.	Task 1 report	1.1.9.3.2	32	Table 1-6	What does the total Energy (PJ prim) stands for? If it corresponds to total EU energy demand, including all fuels, it does not correspond to the value given in the reference document.	Clarify and modify Table 1-6 using the reference document.	In processing
54.	Task 1 report	1.1.9.4	33	Review of losses	"...models have been worked out based on empirical findings". The objective of the report is to provide detailed, verifiable and transparent calculation to confirm or infirm the interest of ecodesign measures on products. They should not be based on "empirical findings" without source of information and agreement of hypothesis by stakeholders.	Provide transparency on hypothesis, calculation and data source.	Very limited data on the number of circuits, length of each circuit, cable size , used circuit breakers in buildings in Europe is available. Therefore some assumptions and hypothesis have to be used. The values for these assumptions for the residential respectively services model in this first screening are mentioned in table 1-7 and 1-8.

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55.	Task 1 report	1.1.9.4	33	Review of losses	"...upon the answers on the questionnaire for installers". The summary of the installers answer has not been documented and communicated	Please make available the report on installers' feedback.	Aggregated values from the surveys were presented on the first stakeholder meeting and can be found on http://www.erp4cables.net/node/6 . Also table 3-5 and 3-8 in Task 3 provide the results of the queries on length of and number of nodes per circuit type.
56.	Task 1 report	1.1.9.4	33	Loss ratio	Iavg is not defined yet.	Provide definition of Iavg and calculation method.	Accepted Added
57.	Task 1 report	1.1.9.4.1	33	Residential cable losses	The Egemin report does not include the residential application. Where does this part comes from? How have been the different assumptions decided?	Provide transparency on the assumptions and calculation used	1.1.9.3 is based upon the Egemin stud(now publicly available, see comment 47). 1.1.9.4 is a check that VITO did with our own assumptions and models.

58.	Task 1 report	1.1.9.4.1	33	Residential cable losses	MEErP methodology (Part 2 – Chapter 6) informs that “to avoid that in further studies these efforts have to be made again, the chapter 6 provides an overview of reference data that can be used”. Data from MEErP should then be used instead of other data.	It should be considered to use datas extracted from MEErP methodology	Accepted, if data is available.
59.	Task 1 report	1.1.9.4.1	33	Copper amount	It is mentioned that the copper amount of the model is 25kg/100m² . What is the assumption of the model area? 84m² as the average floor area?	Please provide the value of the average floor considered for the calculation and check that it fit with the quantity of cables installed.	m² is changed according to MEErP.
60.	Task 1 report	1.1.9.4.1	34	Table 1-7	No information is provided on how the calculations have been done, what are Imax, cable resistivity? How are Kf, Lf, Kf, PF determined? Which hypothesis	Provide more information to explain how calculation have been done of each line of the table and how assumptions have been decided (like for kd for instance).	In processing
61.	Task 1 report	1.1.9.4.1	34	Table 1-7	Separate the two RESL2L and RESL2S circuits, as it is done for the two RESL2D circuits.	Separate the two lighting and socket circuits, as it is done for the two dedicated circuits for better clarity.	In processing
62.	Task 1 report	1.1.9.4.1	34	Table 1-7 and Table 1-8	The distribution circuit length has not been filled by installers according to task 3 report. Where do the 30meters come from?	Provide source of hypothesis and calculation when necessary.	In processing
63.	Task 1 report	1.1.9.4.2	35	Table 1-8	Length of the circuit has been estimated to 30 to 35m based on installers’ answers. How the number of circuits has been estimated?	Explain the way the number of circuits has been estimated.	In processing

64.	Task 1 report	1.1.9.4.2	35	Table 1-8	Like for table 1-7, No information is provided on how the calculations have been done, what are Imax, cable	Provide more information to explain how calculation have been done of each line of the cable and how	In processing

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65.					resistivity? How are Kf, Lf, Kf, PF determined? Which hypothesis	assumptions have been decided (like for kd for instance).	
66.	Task 1 report	1.1.9.4.3	35	Estimated industry sector cable losses.	Considering the choice of a cable section is based on : - Max intensity needed by the equipments - Voltage drop that can lead to higher cross-section than the one defined previously - The short-circuit intensity that can lead to higher cross-section than the one defined previously - The maximum admissible cable length How can it be concluded that the losses will be between 1 and 8%, without any industry building data or calculation?	Justify such assumptions provided without any calculation. Provide transparency and reliability on the calculation done.	In processing
67.	Task 1 report	1.1.9.4.4	35	Summary of estimated losses	An average of losses of 2% is given : - For residential and services, explanations of calculations and assumptions are missing. - For industry sector, no calculation have been provided	Explain the calculation for mean 2% losses.	In processing
68.	Task 1 report	1.1.9.4.4	36	Summary of cable losses	“most of the installers (75%) ....” : Make publicly available the report based on installers answers.	Provide report of answers from installers.	Rejected because of confidentiality
69.	Task 1 report	1.1.9.4.4	36	Summary of cable losses	Losses for residential buildings and Industrial/Service buildings are calculated with different methodology	Use same methodology for both building areas (residential and Industry/Service)	In processing

70.	Task 1 report	1.1.9.45	36	Potential improvement	A section increase of S+1 or S+2 or even higher is technically feasible on the power cable side. Nevertheless, such cable size increase is not always feasible on a building side, considering infrastructure and equipment modification	Provide a technical evaluation considering the all building on such proposed measure to evaluate the level of size increase which is feasible technically considering building and equipments.	In processing
71.	Task 1 report	1.1.9.5	36	Improvement potential	An annual rate refurbishment of 3% is European target. Nevertheless, it seems that the effective refurbishment in Europe is not so high.	Update the refurbishment rate with up-to date values	In processing
72.	Task 1 report	1.1.9.5	36	Improvement potential	The energy consumption in the table does not correspond to the data provided by the document “EU energy trend” used as reference. The energy consumption for electricity is	Provide explanation on where this 25 182 PJ comes from.	In processing

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					around 10 000PJ and not 25 182PJ for		
73.	Task 1 report	1.1.9.5	36	Improvement potential	Any energy savings calculation should also take into account the additional energy consumption to produce the higher cross-section cables as well as additional energy consumption for equipments, installation and infrastructure. It should also take into account the additional resources needed.	Provide a life cycle approach taking into account all life cycle phases and other environmental indicators such as resource depletion.	This will be done in later tasks. This is a first screening on energy loss in the cable.
74.	Task 1 report	1.1.9.5	38	Improvement potential	On a technical point of view, the feasibility and consequences on the installation and on the buildings to upgrade to a section S+2 or S+3 has to be checked. First feedbacks from expert is that it is not possible (lack of space for instance in building conduits).	Evaluated with installers on the feasibility to upgrade from S to S+2 or S+3.	Feasibility is not investigated in the first screening. In following tasks this will be taken into account. For instance in tasks 3 the barriers are mentioned
75.	Task 1 report	1.1.9.5	38	Improvement potential	Similar calculation could be done on resource depletion by using table 1-28. By only considering copper, upgrading from S to S+x would respectively increase the resource consumption of, in average : +39% for S+1 + 95% for S+2 +179% for S+3	Provide a Life Cycle approach taking into account other environmental indicator such as Resource depletion in the calculations, to avoid burdens shifting between life cycle steps or medias.	This will be done in later tasks. This is a first screening on energy loss in the cable.

76.	Task 1 report	1.1.9.7		Conclusion from the first screening	The mentioned saving potential are “brutto” calculations not considering negative impacts for producing and installing bigger cables	Make a note that this potential savings do not yet include any adverse effect for producing and installing bigger cables.	This will be taken into account in later tasks. This is a first screening on energy loss in power cable.
77.	Task 1 report	1.1.1.1.9	51	Table 1-17	The designation code provided for France is not correct. The H07 RN-F is NOT a single core PVC insulated cable with a solid copper conductor. Such product designation in France is H07-V-U	Check the designation code provided in the table. Complete the table as there are many more code designations existing	Accepted Formulated more in general.
78.	Task 1 report	1.1.1.1.9	51	Table 1-17	Table is not complete and correct.	Table should be deleted .	Accepted Table removed
79.	Task 1 report	1.1.1.1.9	51	Table 1-17	Sweden is missing in table.	Add: Sweden SS 4240231-3	Table removed
80.	Task 1 report	1.2.1.3	54	New standards	Should also be mentioned - the 60364-8-1 on “ Low voltage electrical installations - Energy Efficiency “ - The XPC 08-100 on Environmental declaration for EE and HVAC-R products in buildings	Add the 60364-8-1 and XPC08-100 reference	Accepted Added

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81.	Task 1 report	1.3.1.1	55	Legislation	Should be added in the list of factors : "Installation mode"		Accepted Added
82.	Task 1 report	1.3.1.1	56	Legislation	"Cable manufacturers adhere to the European RoHS and recycle everything from copper to plastics".	Where this sentence comes from (source). Would be more appropriate to mention "participate to recycling for copper and plastics". All power cables are not submitted to RoHS. It depends on the rated voltage of the cable and its final application.	Will be changed, see recycling in task 3 Note: recycling is mentioned in WEEE
83.	Task 1 report	1.3.1.1	56	Legislation	Building cable comes in Low smoke, fire safety version....	This sentence has nothing to do with RoHS, as well as the sentence on EMI.	Accepted Deleted
84.	Task 1 report	1.3.1.1.	56	Legislation	REACh could also be added in the list of legislation applicable to cables.		Accepted Added
85.	Task 1 report	1.3.1.2	57	Legislation	The decree in France on environmental declaration of construction products and electric, electronic and HVAC-R products should be added in this section. The Norwegian legislation on recycling and treatment of Waste has a dedicated section for cables (Amendment 1 on Product groups for EE-products and EE-waste – § 12 on cables and wires)	Add French decree (2013-1264) and Norwegian legislation (FOR-2004-06-01-930).	Accepted Added
86.	Task 1 report	1.3.1.2	57	Table 1-18	Sweden is missing in table	Add: Sweden ELSÄK-FS	Accepted Added

87.	Task 1 report	1.3.1.4	58	Voluntary initiatives	Could be added in this part : - The PEP association to provide environmental impact of EE and HVAC-R products during their whole life cycle - The tools provided by cables manufacturers to calculate the economic optimum section based on the use conditions		Accepted Added

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88.	Task 1 report	Annex 1-B	68	Table 1-20; 1-21; 1-22	The losses are calculated for all section with current rating between 0.5 to 100A. A cable is defined by its maximum intensity above which the temperature of the conductor will be too high and will induce safety issues for the consumers. Calculation should be limited to the maximum intensity allowable for each section.	Modify the table taking into account maximum intensity for each section.	Accepted. Tables are adapted.
89.	Task 1 report	Annex 1-B	71	Table 1-23, 1-24 , 1-26 and 1-24	Similar tables should be also provided on the increase energy and resource consumption to manufacture S+1, S+2 and S+3 cables.	Increased cross-section will negatively impact resource consumption and manufacturing phase. A life cycle approach is necessary to avoid pollution transfer between medias or life phases and to precisely define in which conditions higher cross- section are better on an environmental point of view.	Noted Will be handled in task 5/6
90.	Task 1 report	Annex 1-B	77	Reducing total length of cable circuit	The part 6.3 (Determination of the transformers and switchboards location with the barycentre 336 method.) of IEC 60364-8-1 specifies the method to use to optimize an installation.		Accepted Barycentre method of IEC 60364-8-1 added

91.	Task 1 report	Annex 1-B	77	Reducing the load per circuit	Reducing the load per circuit is feasible, especially in vertical cables used to distribute the intensity. By multiplying the number of cables, intensity per section is reduced and the temperature dissipation improved. It is then possible to replace a section X by 2 conductors with less than X/2 sections. In some case, this could improve both energy and resource indicators. Still it has to be counter balanced by the larger size of the system which is not always technically feasible in buildings.		Noted
92.	Task 2 Report	all	All	source	Date and sources are not always transparent.	Systematically refer to the date and the exact source of the data (web, paper, organization ...)	TBD
93.	Task 2 Report	all	All		Norway : Market figures cannot be given due to only two main manufacturers in Norway and following competition legislation.		Norway is not a EU28 member

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94.	Task 2 Report	2.1	9-10	PRODCOM Data	Is the scope of products really relevant ?	Do not use the info from the PRODCOM database	In MEErP (p42) is stated :" As mentioned by many stakeholders, Eurostat data for these particular items are usually not very reliable for the analysis of individual products, but they do represent the official source for EU policy and as such are a valuable to the policy makers." The figures found in the PRODCOM category will be used to verify data from other sources (reality check). The note on page 10 will updated accordingly.

95.	Task 2 Report	2.1.2	10	PRODCOM Data	Does it also include transportation cables (cars, train, plane, ship) as well as other LV cables for industry and infrastructure applications?		NACE code "27321380" is defined in PRODCOM as " Other electric conductors, for a voltage <= 1000 V, not fitted with connectors". No exclusions are mentioned, so all mentioned cables in the comment are part of it, as indicated by "others" in the note on page 10.
96.	Task 2 Report	2.2.1.3	12	CRU Wire and Cable Source	We do not consider that this source is a relevant and reliable source to know the Building market, because the product scope is too wide and do not strictly correspond to cables inside a building. **"LV energy**" category includes cables for buildings, but also LV cables for industry and OEM application, meaning automotive, rolling stock … It also includes 1 kV power cables . As an ex, there are 3 to 5 km of cables inside one car, so it really impacts the figures that CRU can show.	Do not use this source of info.	This source is only used to check other sources (upper limit). Extra note is added.

97.	Task 2 Report	2.2.2.2	13-15	Building Stock	We do not agree with the figures and ratios given in this section, mainly because of the period taken into account. The 2005-2010 period is considered , which was a booming period on the building market. The crisis started in 2008, with a deeper effect starting in 2009-2010. **So it is not relevant to calculate market growth hypothesis based on the analysis of data before 2010.**	Use the data of EUROCONSTRUCT and EUROSTAT instead. They are reliable source of information The scope of EUROCONSTRUCT does not completely includes the EU 27 countries but we consider it as relevant and reliable. It consolidates reliable data from 17 EU countries + Norway + Switzerland (which are not strictly speaking into the EU 27) We consider that the 10 countries not taken into account do not change so much the trends of the market. Out of the scope countries are Bulgarie, Chypre, Grèce, Malte, Roumanie, Slovénie, Lettonie, Lituanie, Estonie, Luxembourg.	Please provide report (or relevant section) Note: and the permission to use it in a public study

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98.	Task 2 Report	2.2.2.3	15-16	Power Cable stock	We do not know how the ratio of 25% has been calculated so we cannot agree	Be more transparent on the calculation formula	Reference added
99.	Task 2 Report	2.2.2.4	17-18	Distribution of power cables based upon cross sectional area	The input of installers is necessary here. The source of data mentioned here is not enough	Meet installers and design offices to get more info about cable installed in buildings	New enquiry will be discussed in the next stakeholder meeting
100.	Task 2 Report	2.2.3	18	New Sales growth rate	We do not agree with the figures given in this section They are based on the 2005-2010 period, which is not representative of the current market situation and in the next few years	Check Euroconstruct report published in 2013	Please provide report (or relevant section) Note: and the permission to use it in a public study
101.	Task 2 Report	2.2.4	18-19	Replacement sales growth rate	We do not agree with the figures given in this section They are based on the 2005-2010 period, which is not representative of the current market situation and in the next few years	Check Euroconstruct report published in 2013	Please provide an extract with relevant data.. Note: and the permission to use it in a public study
102.	Task 2 Report	2.2.4	18-19	Conclusion	We do not agree on the assumptions taken. The ratio for cable replacement during renovation, based on the case in Germany, cannot be applied for all Europe	Check with installers and national building authorities, in charge of the control of the installations.	Please provide more data on cable replacement during renovation. New enquiry will be discussed in the next stakeholder meeting

103.	Task 2 Report	2.2.5	20	Market and stock data summary	Data not accurate	Review according to the previous comments	
104.	Task 2 Report	2.4	21	Consumer expenditure base data	We do not agree with the methodologies used to calculate “purchase prices” and costs. They are too “ simple” and not accurate.	The right assumption for price could be: Cable price = K1 *copper price + K2 (K1 and K2 = 2 constants). K2 to reflect the plastics, labor cost and other added values.	Added formula and footnote to indicate the origin of the purchase price. Please provide the data if you can’t agree with this figure.

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105.	Task 2 Report	2.4.1	21	Purchase price	The definition of the consumer is unclear: is it the end- customer ? the installer ? the wholesaler ? Which “purchase price” do we talk about ?	Clear definition	Added footnote.
106.	Task 2 Report	2.4.5	22	Disposal costs / benefits	How the ration of 70% has been defined ?	More transparency on the way ratios are calculated. There are official companies today who takes back the cable scraps. They could be a good source of info.	In processing
107.	Task 3 Report				Norway comment : Installation friendliness of cables and effective/smart packaging is key for the el-installers. In addition to the el-installers, consultants may specify the type of cables to be used, especially for official buildings. Also that cables should be possible to install, repair and maintenance during a long, cold winter period, i.e. the protective polymer layers should not crack at low temperatures		Will be added
108.	Task 3 Report	3.1.2.2	14	Cross- sectional area	The selection of the CSA is first done considering the intensity that need to be transported	Add in the list: their maximum admissible intensity.	In processing
109.	Task 3 Report	3.1.2.2	14	CSA	In installation conditions should be also included the installation type		Agree. Is added.

110.	Task 3 Report	3.1.2.2	14	Table 3.2	Values to be checked by installers, in particular the min ones.		New survey towards installers and engineering companies?
111.	Task 3 Report	3.1.2.5	16	Conclusion	First feedback is that skin effect is relevant in buildings. In that case, it may be interesting to use 2 cables with reduced cross section instead of 1 with large CSA		Added extra consideration in the conclusion.
112.	Task 3 report	3.1.4.5	16	Table 3.4	How has the correction factor for lighting circuit been determined?	Clarify the calculation for the correction factor of lighting circuit.	Correction factor is removed.

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113.	Task 3 Report	3.1.4.5	22	Conclusion	Assuming that dedicated and distribution circuit have the same length is strange. Question should be asked to installers having filled the questionnaire why they did not provide information on distribution circuit. There should be a reason	Provider the report on installers feedback. Clarify the distribution circuit length with installers and why no answer has been provided.	Only aggregated values can be released (privacy statement) which in fact is table 3-5 . The question regarding the length of a distribution circuit was not asked at that time. It will be asked in a new survey.
114.	Task 3 Report	3.1.4.8	23	Table 3-6	Values have to be validated by installers stakeholders.	Validate Table 3-6 with installers stakeholders.	These are the results of the installers inquiry, except for the lengths on the distribution circuits. The organization AIE representing the installers is one of the stakeholders in the study and has received the report. In a new survey (TBD), installers can validate this data.

115.	Task 3 Report	3.1.4.6	24	Table 3-7	In Annex B, the load branch length depends on the number of branches (varies between 0.2m and 1m). Could you explain why? It should be constant and represent the effective load branch length in a circuit, information to be provided by installers? Moreover, how is the load branch factor selected to 10%? This assumption may have a high impact. For instance, considering that all the length of cables between nodes are equal, the kd factor will change from 0.4 to 0.24 for 6 branches for instance.	Justify calculation of kd factor and validate the assumptions with installers.	Average branch length was not asked in the inquiry. Added extra tables in Annex B load branch factor corresponding with a load branch of 50% , 100% and 200% factor to illustrate the effect of this factor. Will be included in the new survey for validation.
116.	Task 3 Report	3.1.4.6	24	Table 3-8	Units in the table are in (m). If a number of nodes, there should be no unit	Clarify the unit in the table.	Accepted. Unit is removed in the table.
117.	Task 3 Report	3.1.4.6	25	Table 3-9	The values proposed in the table do not correspond to the aggregation between table 3-7 and table 3-8. For instance in residential, average number of socket given is 10.3, which should lead in table 3-9 of a kd factor avg of less than 0.38. The value provided in table 3-9 is 0.5	Clarify the values provided in table 3-9 and their calculation method.	Agree, table is adapted.

118.	Task 3 Report	3.1.4.7	25	Rated diversity factor	To be confirmed. Example?		The load factor and load form factor are specified at the level of the circuit load. So no diversity factor is needed.
119.	Task 3 Report	3.1.4.9	26	Installation method	The method of installation has an impact on the max admissible intensity in the cable. In the formula 3.2 and 3.5 it will then impact the I and not the r or the section.	Modify the sentence.	Sentence changed.
120.	Task 3 Report	3.1.4.10	27	Single or three phase system	The purpose of this chapter is not clear. What is the conclusion?	Clarify this chapter.	For clarification: one can have a 3-phase connection to the distribution board and only use single phase circuits.

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121.	Task 3 Report	3.1.4.11	27	Distribution levels	In Page 29 of task 1, it is mentioned that single family houses have generally one circuit level. For residential application, the ratio of single family houses and multi-dwelling buildings should be taken into account to calculate the percentage of distribution level to be considered, and to apply if necessary a correction factor in the calculation. In MEErP Part 2, values provided are 54% of one/two family dwellings and 46% multifamily dwellings.	For residential, take into account this ratio of houses with or without distribution level. Otherwise, distribution losses estimation for residential will be doubled.	Added
122.	Task 3 Report	3.1.4.12	27	Rate diversity factor	To be validated by installers. Is it a coefficient used to design the installation (and thus would be a max diversity factor for safety) or is it the effective one that could be “measured” in a building?		Conclusion has been adapted, because this factor will not be used in Task 4 till 7. See also 3.1.4.7.
123.	Task 3 Report	3.1.5.1	28	Load factor	All assumptions should be carefully looked at. For instance, considering the office lighting, and using the data from MEERP part 2 (p177), considering offices and conference rooms surfaces, the load factor will be 0.82*2061+0.18*650 = 1806 = 20%. Modification in assumptions may have a great impact on the energy savings calculation	Use as much as possible assumptions from MEErP methodology when available.	The sensisivity will take care of this issue. MEErP part 2 will be looked at. Note: This data is for ventilation systems, not for lighting (different operating hours)
124.	Task 3 Report	3.1.5.1	28	Load factor	How is the load form factor of 1.96 calculated?	Clarify the calculations	Added formula

125.	Task 3 Report	3.1.5.1	30	Table 3-11, 3-12 and 3-13	Please provide information on assumptions (source) and calculation method done for all the data, as well as units when applicable.	Detail assumptions and calculated methods used to complete the table.	Only Kf, αc and their product are calculated. Formulas are mentioned on page 28 and 29. All other fields are assumptions.
126.	Task 3 Report	3.2.1	36	Space heating	Agree on the yellow comment.		Noted
127.	Task 3 Report	3.3	37	End of Life	Actual text • Present fractions to recycling, re-use and disposal for copper:95%?, 0%, 5%? • Present fractions to recycling, re-use and disposal for aluminium:95%?, 0%, 5%? • Present fractions to recycling, re-use and disposal for insulation:50%?, 0%, 50%?	Assumptions proposal : • recycling rate of copper and aluminium of reclaimed and recycled cables close to 95% • recycling rate of the reclaimed insulation: unpredicatble. May completely change depending on: ✓ the kind of materials (rubber poorly	Text has been changed. Defaults of EcoReport tool are used, except for re-use.

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					• Present fraction of second hand use and refurbishment: 0% • Product use & stock life: 40 years? • Repair & maintenance practice: not existing • Collection rate: 95 %? • Second hand use: not existing Agree on 40 years lifetime and 0% for second-hand use. No information on other assumptions	recyclable, plastic is better recyclable) the possibility to separate the plastics from the rest of the cable (which may depend on the cable design and plastics mix) Present fraction of second hand use and refurbishment: 0% □ Product use & stock life: 40 years □ Repair & maintenance practice: o at the end of life, not repaired. o During life, repair possible for big cross sections after accidental damage. Collection rate: No data available. Will be different country by country. □ Second hand use: not existing	

128.	Task 3 Report	3.4.1.3	37	Refurbishment	Financial incentives for wall insulation or new window have no stimulation effect on electrical installation renewal. Only financial incentives could push for such renovation.	Review or remove this chapter	Reformulated.
129.	Task 3 Report	3.4.2.1	38	Existing installation	Two additional barrier could be added in this chapter : - The higher cable volume that could avoid any possible renewal due to lack of space (already mentioned in 3.4.2.3). - Moreover, apart from the space, use of higher cross-section will induce a non negligible cost increase of the installation due to building infrastructure. - Finally, any modification of cables size will require a modification of the other equipments such as socket-outlet and other accessories in the electrical installation	Review this chapter with other negative impact on the installation	Added.

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130.	Task 3 Report	3.4.2	38	Barriers	Should also be mentioned as a barrier the additional cost of S+x cables related to : - Cable manufacturing cost - Cable transportation cost - Cable installation cost if more time is needed - Electrical system increased cost.		Added
131.	Task 3 Report	3.4.2.2	39	Material use	How are the 1.2 to 9.7 million tons over 15 years calculated?	Provide the detailed calculation	Total paragraph has been deleted, because consequences of design options will be calculated in Task 6.
132.	Task 3 Report	3.4.2.2	39	Material use	It is mentioned “in 2009, recycled copper met 45.7% of Europe’s demand”; Is this information used to calculate the million tonnes extra per year? If yes, it should not be used. The use of recycled copper in electrical cables is limited due to its negative effect on copper resistance, and increased losses	Detail the calculation method used.	The factor was not used in the calculation. Sentence is removed.

133.	Task 3 Report	3.4.2.2	39	Material use	As calculation has been done for volume increase of copper, a similar table as table 3-16 should be provided for insulation volume increase. A S+1 strategy lead to a mean increase of +40% insulation volume increase. A S+2 strategy lead to a mean increase of +95% insulation volume increase	Provide volume and cost increase for the proposed (S+1 and S+2) proposed strategy for both copper and insulation.	The assumption that the outer radius increases with the same factor as the inner radius of the insulation cylinder for a s+x strategy is not correct. Total paragraph and annex A has been deleted, because consequences of design options will be calculated in Task 6.
134.	Task 3 Report	3.4.2.3	40	Handling and space requirements	As already mentioned, higher cross-section cable will have a high impact on building design and cost due to the need for more space.	Add the impact of the higher cross-section on the building design and cost.	Cost implications is added.
135.	Task 3 Report	3.4.4	41	Physical environment	Ducts and tubing is not mentioned specific	Add: Thicker cables need larger ducts and tubing, which drives the costs	Added