Ecodesign Preparatory study on Smart Appliances

Overview of comments of stakeholders

Date: 22/12/2015	Document: **Task 1 report overview of comments**

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Section No./ Subsection No./ Annex (e.g. 3.1)	**Page and Paragraph/ Figure/Table/ Note** (e.g. p 6 para 5)	**Type of com-ment**[1]	**SH**[2]	**Comment (justification for change) by the Stakeholder**	**Proposed change by the Stakeholder**	**Consortium observations** on each comment submitted

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A. COMMENTS OF ORGANIZATIONS

Please find below the comments of organizations (using the format) on the draft of the Task 1 report for the Ecodesign Preparatory Study on Smart Appliances :

- ANEC BEUC — ANEC/BEUC
- ATG — Ariston Thermo Group
- BDEW — German Association for Energy and Water Industries
- CECAPI — European Committee of Electrical Installation Equipment Manufacturers
- CECED — European Committee of Domestic Equipment Manufacturers
- CENELEC TC13 — European Committee for Electrotechnical Standardization
- CLASP — CLASP ngo
- DAIKIN — Daikin Europe NV
- ECODESIGN — ECODESIGN company GmbH
- ECOS — European environmental Citizens' Organisation for Standardisation

EHI — European Heating Industry

- ENEA — Italian National Agency for New Technologies, Energy and Sustainable Economic Development
- EPEE — European Partnership for Energy and the Environment
- ESMIG — European Smart Metering Industry Group
- eu.bac — European Building Automation and Controls Association
- JBCE — Japan Business Council in Europe
- NVE — Norwegian Water Resources and Energy Directorate
- RWE — RWE Deutschland AG
- UBA — Umweltbundesamt - Federal Environment Agency

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General		ge	ATG	<u>Relevance of Water heating</u> Storage water heating represents one of the applications with the highest DR potential. This is not due only because of the absolute value of the energy involved but also because this type of application provides a capacity to store the energy in a form ready to be delivered to the user without any further transformation (and losses). Storage WHs fit into several types of DR and represent one of the highest potential application to balance supply and load, in terms of anticipation or delay, in terms of time lapse or consumption modulation We find puzzling that one of the products with the highest potential is not even taken into consideration for use cases already developed or that could be developed. <u>Relevance of storage water heaters</u> The study classifies WH as a continuous appliance, homogeneously with refrigerators and freezers. We find this definition generic. The relevance of all those products from a DR standpoint is their capacity to store energy and deliver it to the user when it is needed. as detailed in the analysis only storage WH have a real DR potential and can operate continuously, as per the provided definition. We propose to amend the definitions accordingly. <u>Long term scenarios</u> The study correctly elaborates about the DR potential in the medium to long term; however the projections do not portray the long term changes that are foreseen. At page 2 iIt is forecast correctly that heating and transportations will be increasingly electrified. However the potentials are calculated on the basis of a rather BAU situation: at page 57 (Page 7 of the annex) 10% increase is foreseen in the installed base from 2015 till 2030. Apparently the two statements are contradictory . it would be beneficial to clarify what the DR potential would be, in case storage		The category has been renamed and the definitions have been amended as proposed. A difference was made between storage water heating and continuous water heating. We will try to mirror the increased electrification in the scenarios. Appliances not within the scope of the Ecodesign and Energy labelling framework (e.g. electrical vehicles) are not within the scope of this study. A separate use case was developed combining storage water heating with grid congestion management

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				WH becomes the prevailing application for water heating. As far as electric transportation is concerned we acknowledge that electric cars are outside the scope of a possible eco-design measure. This does not imply that the relevance of electric cars Demand and DR potentials is totally ignored. It would be beneficial if the study includes a chapter identifying the long term perspectives/forecast coherently with the target of reducing GHG emissions by 80% by 2050.		
General		ge	BDEW	The developments in this field are fast paced and not easy to assess beforehand. A potential Ecodesign Regulation in this field should not lead to restrictions of this development.		This will be part of the Task 8 report on policy options
General		ge	BDEW	Germany: According to the Federal Ministry for Economy and Energy as well as the Federal Office for Information Security (BSI) all communication processes necessary for the described Use Cases need to go via the Smart Meter Gateway and a downstream BSI-conform control box. The respective processes necessary for this have been described by BSI.		More information has been asked to BDEW
Overall		ge	eu.bac	The scope seems unclear and we are unsure what the Commission are looking to achieve from this study. While the Task 1 report outlines in more detail what is defined as a smart appliance, in the context of this study it is still not clear what the recommendation would be and how this would be structured under a framework directive like Ecodesign.	It is important to remember that Ecodesign is covering Energy related Products that have an impact on energy consumption during use phase and on wider environmental issues.	This will be part of the Task 8 report on policy options
Overall		ge	eu.bac	One could consider the preparatory study of Lot 33 Smart Appliances as being the draft of a new type of regulation to drive energy flexibility usage, open energy sourcing market and new type of contractual situations between the consumers, the energy utilities and the electricity grid. This should encompass the standardization of energy sourcing contracts, the standardization of DR requests and the technical	However, it is a crucial concern at this stage if Ecodesign is the suitable market mechanism to standardise the data models for smart appliances. Standardisation work in CEN/CENELEC and ETSI, which is referenced in the Task 1 report, is making great progress in defining a top level of standardisation for ensuring systems “speak” the same language	This will be part of the Task 8 report on policy options

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				solutions in the building equipment to provide this management and flexibility.	and are therefore able to interpret commands effectively. Provided this standardisation work remains open and transparent, and member states contribute effectively, we do not foresee interoperability being a problem for consumers.	
Overall		ge	eu.bac	The “smart” feature or the DR capability is an energy flexibility feature and not an energy performance feature. „Because of these characteristics, smart appliances potentially have a positive impact on the environmental performance of the energy system by helping accommodating renewables and increasing the energy efficiency of the energy conversion, transmission and distribution.” This may cause a worse energy performance of the device itself to ensure a better global environmental performance. User case 1: A heating system example, the DR signal “Load shifting” would signal the heating appliance to heat the building before the peak period (for which it would be switched off) to insure comfort and result globally to a higher energy consumption (because you need to heat more before to avoid discomfort during peak period). However, as the primary production at the utility avoids starting new plants, this would have potentially a positive environmental macro-effect depending on the plants concerned).	For Building Automation and Control Systems (BACS), this function, called Demand Limiting DL, has been used to adapt to a particular energy sourcing contract. BACS have functions that are adapted to combine the Demand Limiting function with other optimization functions like Duty Cycling DC, or Optimal Start/Stop OSS of equipment.	The energy consumption of the DR capability is handled in the next Task reports, as well as the global environmental impact.
Overall		ge	eu.bac	In non-residential buildings (especially large ones), which have BACS, the need for smart appliances does not exist as the demand response requests can be fulfilled directly by the BACS, which by definition controls each equipment. The facility owner parameterize then the sourcing contract, e.g. the energy price per hour in the control system and defines in the control system the balance between comfort/ maintenance costs and energy	These 2 user cases show that direct DR request to smart appliance in non-residential buildings could have the reverse effect. Therefore, non-residential buildings having the equipment linked to a BACS should be exempted of the smart appliance feature as this function is already fulfilled by the BACS. An alternative to this position would be to consider	A smart appliance is an appliance that supports the functionality required to execute DR actions. If the appliances controlled by the BACS already do so, then they are already ‘smart’ and no exemption would be

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				supply costs. User case 2: In a large facility, a lighting appliance could be considered smart because during the day, 50% of the lighting spots could be switched off to reduce electricity consumption during a peak period. But, if we suppose that the building users can manually override the blind management, they could open more blinds which would create higher cooling load in the rooms e.g. an energy consumption overrun in the HVAC system which would be a lot higher than the electricity saved on lighting during the peak period. User case 3: Pumps for HVAC systems are also an electricity load, which could be considered to be managed as smart appliance and for example switched off during a peak period. But switching off some pumps for some circuits during a peak limiting period would have consequences upstream and downstream: Upstream, the chiller or the heat pump could be less energy efficient during the peak period (degrading the ESEER and COP because the load has been reduced) and create after the peak period an inefficient energy consumption when the terminal units will have to consume more energy to get back to the set point parameters. HVAC systems are always more energy efficient in a stable mode than in a start/stop mode. Large buildings are proof for the interaction between the various equipment.	the BACS and at the same time the total building itself as a smart appliance - Smart Building - a kind of macro smart appliance. The type of DR request for such a macro smart appliance would then be strictly the contractual obligation of the parties, the consumer /building user and the energy utility with the management of this obligation as function of the BACS.	required. No claims are made as to who or what should activate the DR functionality of the smart appliances. On the contrary, as stated in 1.5.2 (communication architectures), we see multiple architectures - all of which should be supported -, one of which is what we call the central energy manager model. The BACS is such a central manager, which optimizes the control of the smart appliances, both for DR and energy efficiency. A use case example has been added to 1.3.2 to highlight the BACS example (Use case example 6: Peak shaving combined with energy efficiency by appliances controlled by a building automation and control system) A footnote has been added to 1.5.2 to highlight the BACS example: “A special example of this are Building Automation and Control Systems (BACS),

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						which already today are used in larger/non-residential buildings to control and optimize the energy consumption of the building. Contrary to typical residential appliances, the communication and control functionality required for DR is already largely available. BACS can support DR through its control of the HVAC, heating, etc. systems in the building, while at the same time optimize the energy efficiency of the building as a whole."
All document	All document	ge	ECO DESIGN	Very long sentences without any punctuation are included in the paragraphs over and over again, making the reading very hard for non-native english speakers, and possibly for native english speakers too.	A professional text reviewer/editor could support in the final drafting of the report(s) in English.	
All document	All document	ge	ECO DESIGN	The sub-sections after third level sections numbered as x.x.x are presented with different formats: at times „->" is used combined with a bold text for the title, some others are underlined with normal text for the title.	Please harmonize the format in the main document for the sub-sections below the third level sections (x.x.x).	Done
All document	All document	ge	ECO DESIGN	„...the Figure below"....	Figures shall be introduced in the text, including their number.	Done
	Even pages		ECO DESIGN	All even pages (2, 4, 6..etc) are shown as „[type text]", and not the real number.	Include even page numbers, in correct sequence in the main document.	Done
Table of contents	Page i	ge	ECO DESI	Table of contents.	Possibly structure this document in a way that a clear path, a logic is presented to the reader on	Done

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			GN		the sequence of the different topics addressed. Consider also the many subsections that are NOT numbered, possibly giving them also a specific number in the document.	
List of acronyms	p. iv	ge	ECO DESI GN	- Missing abbreviations (e.g., AMI) - Wrongly used abbreviations (e.g., CO2 instead of CO2) - Repeated abbreviations (e.g., PV).	Revise document to update the list of acronyms.	Done: delete repeated abbreviations
List of acronyms	p iv	ed	CECA PI	Referring to CENELEC TC 205 WG12	Introduce CEM : customer energy manager	This is added
1.1	p 1 para 2	ge	ECO DESI GN	..."Smart appliances are an essential part of a smart electricity grid, which is part of the framework...."	This would be the ideal case, but the penetration of smart applinaces at this moment is very low in the EU and the smart grids as such are not yet a reality. The text should be revised to give an indication of a future development, e.g., that (Smart grids) are one goal under the framework strategy for the Energy Union.	Link to Energy Union Package Communication is made.
1.1	p 1 para 3	ge	ATG	Smart heating is seen across the study as a high potential application but only in the delay mode (postponing operations till when the peak load has finished. This vision reduces the value of the flexibility provided by storage water heaters that can play a role both in postponement and anticipation of demand, providing highest flexibility. We propose that the potential use case should consider both options not only one.	A potential use case for smart heating is a situation, where a peak electricity load is foreseen the next day, which would have required starting up power generating units at higher costs and/or higher environmental impacts. Instead, a signal is sent from the electricity supply system to a number of heating installations to switch off during a shorter period just before the peak load without significant impact on comfort. **<u>Addition from the consortium: Smart heating, if coupled with some thermal storage capacity can also play a role when a peak in electricity generation is foreseen, which would have required starting up energy storage units (batteries or pumps) with low efficiency.</u>** **<u>Heating units (mainly water heaters) can start operating when there is an excess of supply</u>**	Yes. Smart heating in the text is intended to include all these uses. The example in 1.1 has been extended: "Instead, a signal is sent from the electricity supply system to a number of heating installations to switch off during a shorter period just before the peak load, or to produce and buffer heat well before the peak, both without significant impact on comfort. Another example is where heating installations are activated when (renewable) electricity

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					and release the hot water to the consumer at his/her best convenience.	production is abundant, to produce and buffer the heat required later on."
1.1	p 1 para 3	ge	NVE	It is also relevant to focus on the case where a distribution company shall decide to reinforce the grid due to new loads like PV, EV or electric heat pumps. In this case DR might be an economical beneficial solution compared to reinforcing the grid.	*Smart appliances are appliances or groups of appliances which can respond to external signals (also called Demand Response, DR) and modify their energy consumption patterns in order to optimise the balance between energy* ***supply-demand and/or grid congestion.***	Text adapted as suggested.
1.1	p 1 para 5	te	ECO DESI GN	.."There are many developments at the consumer side that support the introduction of demand response and smart appliances: Rollout of smart meters with electricity....."	Smart meter roll-out are not developments at consumer side, but deployments organized (mandated) by the governments of Member States in response to specific EU Directives (Internal market and efficiency directives)	Text adapted: "at the consumer side" deleted
1.1	pp 1-2	ge	CLAS P	CLASP suggests that it would be beneficial to further develop this chapter to cover several aspects: - Objectives of the study: it is noted that this study differs from the typical ecodesign study but without spelling-out what the objectives of this study would be. Is the study attempting to: (1) present a SWOT analysis of smart appliances (in which case the goal(s) of smart appliances should first be defined); (2) suggest how smartness of appliances should be dealt with in ecodesign and labelling measures (in which case the environmental impacts of various scenarios should be quantified and the benefits and drawback for each category of stakeholders should be considered); or (3) aim at identifying the gaps and needs for a broad deployment of smart appliances (in which case the approach would be absolutely different from the typical ecodesign prerparatory study)? - Expected structure of the report: it is mentioned that „the MEErP approach and the calculation tools will fit	Please include the objectives of the study. Please clarify the methodologies that will be used	Adaptations of the text were done

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				well for some aspects, less for others“ but without clarifying what the differences and alternative approaches are expected to be. An overview given from a draft complete Table of Contents for example would have facilitated our review of this first Task and the provision of relevant comments. - Energy network: in order to understand the potential benefits of smart appliances and Demand Response (DR) in a more concrete way, it would be beneficial to have more background on the European energy network(s). Only by understanding the weaknesses (e.g., magnitude and impacts of the peak loading incidents) and the actions already in place to mitigate those effects can readers more fully engage. Further, information on policy plans such as evolution towards a more integrated EU grid and more decentralised generation should be discussed. With that information, stakeholders can more effectively comment on the relevance and potential options for a deployment of smart appliances.	and include a table of contents. Please include a description of the current state and policy plans of the European energy network.	
1.1	p 2		RWE	The description of the effects of “Demand Response” underestimates the interactions between market-, systems- and grid-serving flexibility. With our EU project FP7 “ADVANCED” we showed that flexibility or smartness has little effect if the expansion scenario is based on local “bottlenecks” caused by an increase of (D)RES. However, flexibility can be appropriate to help integrating RES throughout the system. But this is another dimension of the problem, it also concerns “on grid switching” using different logics as the “off grid switching” being in the middle of the considerations on page 2.		This study focuses on residential smart appliances and their potential in terms of demand response/flexibility. In that respect, a point of attention is to support all/as many as possible business cases for demand response. What business cases are to be preferred or DR market organization topics are not in the scope of this study.

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1.1	p 2 line 5	ge	CECAPI	Add another possible architecture for smart appliances	Introduce as forth bullet point : „ an introduction of a customer energy manager (CEM) optimizing locally the energy usage to the local needs/comfort/performance, ensuring in a secured way the exchange for DR with the grid“	This is discussed at various locations in the document: 1.4, 1.5.1, 1.5.2, etc.
1.1	p 2	ge	ECOS	It is stated that the MEErP methodology will not fit all aspects of this lot and that a “horizontal approach” will be used. We believe that more details on these methodological choices are needed (i.e. which MEErP aspects will be followed, adapted or substituted and how) together with a detailed assessment of repercussions, especially when calculating the environmental benefits in this study.	We invite the study team to provide a substantiated overview of the method to be applied and potential differences from MEErP methodology. Repercussions should be detailed, especially on the calculation of the environmental benefits.	The MEErP methodology will be followed
1.2	p 2 para 1, line 7	ge	ECO DESIGN	..“have not been not designed...“	Have not been designed to...	Done
1.2	p 2 para 1	ge	ECO DESIGN	Demand response (DR)	Demand Response (DR) -> use consistently over the whole text.	OK
1.2	p 2 para 1	ed	ECO DESIGN	What is it meant with „Smart capabilities“?	DR functionality	Definition is revised
1.2	p 2 para 1		ATG	The study correctly identifies in increasing RES and growth of electrification of heating and transport two main reasons for developing smart grids and DR. However the figures presented in the study to assess the potential of the various applications apparently do not take into account that the growth of electricity demand for heating will entail an increase of DR flexibility potential. It is proposed to review the figures in the following chapters to take into account the long term transformation of the demand. As an alternative we propose to add a	The European electricity system is quickly evolving. Although there a large national differences, there is a tendency of decreasing classical centralized power plants with controllable production power and increasing intermittent electricity production from Renewable Energy Sources (RES), combined with growing electrification of heating and transport.	We will try to mirror the growing electrification in the scenarios.

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				foot note to explain the terms of reference of the following analysis.		
1.2	p 2 para 2 (bullet list)	ge	Daikin	We propose to also consider other energy sources instead of only electricity. This would be in line with the transition from 'smart grid' to 'smart energy grid'.	Change 'electricity consumption pattern' into 'energy consumption pattern'.	OK adapted
1.2	p 2 para 2 bullet 5	te	Daikin	For remote control safety, we support that smart capabilities do not need to be activated as default setting. However, more aspects of remote control safety should be considered in order to realize demand control.	Following issues should be discussed: 1. system design considering the uncertainness of communication. 2. risk assessment of remote control with unexpected turn on/off of appliance. 3. who is allowed to overwrite the software of the appliance?	This is handled in the Task 3 report
1.2	p 2 para 2	ge	ECOS	It is unclear how the characteristics of a "smart appliance" have been defined. What is the basis for the selection of the listed criteria?	Describe the rationale and literature behind the smart appliances definition to ensure transparency	Definition is revised
1.2	p 2 para 2 bullet 1	ge	NVE	It is relevant to discuss other smart appliances and their potential and limitations. Smart appliances should therefore have a broader definition. The regulatory borders is a different matter and should be addressed in Task 7 Scenarios report	Remove bullet 1: ***It is an appliance as defined and within the scope of the Ecodesign and Energy labelling framework***	Appliances not within the scope of the Ecodesign and Energy labelling framework (e.g. electrical vehicles) are not within the scope of this study
1.2	p 2 para 2 bullet 2	ge	NVE	Appliances with significant power consumption should be included even if they are not like to be controlled	*It is an appliance that is able to automatically respond to external stimuli such as price information, direct control signals, and power line quality (mainly voltage and frequency)* ***or a high power appliance (> 2 kW?) that requests capacity and reports operational data;***	Focus is on residential sector. Commercial HVAC and refrigeration is looked into. Industrial appliances are out of scope

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1.2	p 2 para 2 bullet 3	ge	NVE	Se comment above	*The response should result in a change of the appliance's **or group of appliances** electricity consumption pattern;*	Point of view for the characteristics is the individual smart appliance. But indeed a single demand response control signal can result in a consumption change of a potentially very large group of smart appliances.
1.2	p 2 para 5	ge	CECED	The characteristics enumerated in the bullet points of this paragraph refer to the definition of a smart appliance. The ecodesign and energy labelling framework refers to the scope of application of that definition. Since the reference to the ecodesign and energy labelling framework does not define a characteristic of the smart appliance, it should not be listed in the bullet points but in the introductory sentence. We suggest hereby a clearer formulation.	~~In the framework of this study~~ **Under the Ecodesign and Energy labelling framework**, a smart appliance is defined by means of the following characteristics: - ~~It is an appliance as defined within the scope of the Ecodesign and energy labelling framework~~ - It is an appliance that is able to (...) - The response should (...)	Definition is revised
1.2	p 2 para 5	ge	CECED	A generic approach is more appropriate for the first bullet point, focusing on the aim of smart appliances: providing demand response and demand side management.	- It is an appliance that is able to automatically respond to external stimuli such as ~~price information, direct control signals, and power line quality (mainly voltage and frequency);~~ **demand response (supporting flexibility) or demand side management (adaptation of load).**	Definition is revised
1.2	p 2 para 2	te	eu.bac	If signals are given real time only the local smartness cannot decide of proper actions and the overall efficiency would suffer.	New bullet point: To give a local „intelligence" a chance, the steering signal (e.g. pricing signals) will need to be ready for at least a 24 h period in advance.	This would exclude many of the most promising DR business cases, including all intraday balancing and grid congestion management schemes. Intraday use of flexibility provided by smart appliances should offer

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						sufficient added value for the end consumer to compensate the stated loss in local efficiency, must may not be excluded from the scope.
1.2	p 2 para 5	ge	CECED	Additional bullet point to add an important distinction between a reactive appliance (one only capable of frequency control) and a smart appliance: A reactive appliance is not a smart appliance as it is not able to process the external signal, notably through a CEM. Thus a reactive appliance cannot take into account consumer's settings, the needs at system level or combining the external signal with the consumption of other appliances in the house, it can only automatically react to the external signal.	- **Smart appliances shall be distinguished from reactive appliances**	This distinction is made in 1.3.1.
1.2	p 2 para 5	ge	CECED	The ability of a smart capability to function all over the EU does not refer to a characteristic of products (smart appliances in this study) but to the regulation that will be targetting that category of products. This bullet point does not fit in the section dedicated to the definition of the characteristics of the products that will be under the scope of the preparatory study.	~~The smart capability must be able to function all over the EU~~	Definition is revised
1.2	p 2 para 2 p 3 para 4	ge	Daikin	The proposed scope creates confusion. On the one hand, reference is made to the scope of Ecodesign and Energy labelling framework. On the other hand, large-scale industry applications are excluded. However, Lot 21 includes chillers and process chillers upto 2MW.	Clarify the boundary of the scope of Lot 33.	Definition is revised
1.2	pp 2-3	ge	EHI	EHI understands that the scope of Lot 33 comprises those appliances with electrical consumption that are able to provide an immediate demand response when receiving a respective communication signal. While some of the products covered by EHI (boilers for gas, oil or solid fuel) are using electricity only for auxiliary	*1.2 This study is focused on appliances which have an immediate demand response capability after receiving a communication signal.*	This aspect is covered by the definition.

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				purposes, there are also heating solutions which use electricity for their primary functions. Many of them do have potential to contribute to the implementation of a broad demand response approach.		
1.2	pp 2-3	ge	UBA	It would be helpful if the authors give a more detailed explanation for their choice of definition. Furthermore we propose to assess in how fare functions that facilitate energy saving user behaviour could also be included.		Definition is revised
1.2	pp 2-3	ge	CLASP	As mentionned in 1.1, the lot "Smart appliances" differs from the typical ecodesign product group in that „smart appliances can be very different products that just have one functionality in common“. Technically speaking, this functionality can be defined as in 1.1: „Smart appliances are appliances which can respond to external signals (also called Demand Response, DR) and modify their energy consumption patterns in order to optimise the balance between energy supply and energy demand“. The typical ecodesign measure aims at improving the efficiency of a type of appliance, i.e. lowering the energy consumption for a same service. But the above description of the functionality doesn't say much about the service that is offered by a smart appliance. For the study to be meaningful in terms of policy strategy it would be necessary to define what is expected from smart appliances and by whom. Clarifying this point may have an impact on the objectives of the study. Defining the functions of smart appliances would also make it possible to analyse in which conditions smart appliances should best be used to fulfill these functions. Other demand side management (DSM) options could also be assessed and compared to the deployment of smart appliances, e.g., targeting of large energy consumers or tariff schemes like EDF's „Tempo“ where energy is significantly more expensive on peak days and	Define smart appliances in terms of their function for different stakeholders (including EU policy makers) in order to assess each policy option with regard to these functions. Identify and discuss other demand side management options and compare their impact to the deployment of smart appliances.	The definition should be a technical definition. Impacts on various stakeholders are part of later reports.

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				consumers get warned the day before on their mobile or smart phone (https://particulier.edf.fr/fr/accueil/facture-etcontrat/contrat/consulter-les-jours-ejp-et-tempo/option-tempo/lacouleur-du-jour.html).		
1.2	p 3 para 2, line 3	ed	ECO DESI GN	..."The analysis will be more in-depth for the appliances with significant potential".	What is meant here with significant potential? Please clarify, is it energy savings, is it load shifting, it is other functionalities?	See the revised definition section.
1.2 1.3.1	p 3 para 4	ge	ECOS	We wonder what the rationale behind the exclusion of "large scale industry applications" is. The study team does not provide any analysis of the consequences of such a decision. This is even more surprising knowing that the discussions in the EC Smart Grid Task Force groups have repeatedly stressed the need to include industrial and commercial customers in the DSR schemes. Moreover, during the Ecodesign Consultation Forum on compressors, ECOS asked the Commission to assess the feasibility of setting Ecodesign requirements for the inclusion of System Frequency Controls on Compressors. The work starting on smart appliances was referred to as an answer, and no measure was taken.	Keep large scale industry application in the scope of the study	Reasons why they are out of scope are clarified
1.2	p 3	te	eu.bac	… Communication and control architectures Standards regarding the interoperability (thus not test standards as such) …	Take this out this is already being defined in the committee IEC TC 57/WG 21 and WG 17, There is no need to spend money on that.	Summing up relevant standards is part of a task 1 ecodesign report. It is not the intention to repeat work done in other committees, but to refer to it. If you have information on standards and gaps analysis relevant to the scope of this study, please provide it.
1.2	p 8	ge	JBCE	Please list up the examples of domestic appliances and commercial / industrial appliances.		They are referred to further in the report

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Ecodesign Preparatory study on Smart Appliances

Overview of comments of stakeholders

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1.2		te	eu.bac	All services are geared toward electricity.	…combined with growing electrification of heating and electrification of building services.	Our definition of smart appliances centers on changes in electricity consumption patterns
1.2		te	eu.bac	Most contracts and load shedding (Rundsteuerung) are not at all geared towards a „prosumer“.	…consumption and production, including contracts and services.	Target of this paragraph is to sketch the evolutions that have created the demand for flexibility and DR technology. New energy products/contracts that support end consumer services to the grid are one of the preconditions to realize DR. This will be discussed more in detail in the parts on user remuneration.
1.2		te	eu.bac	Specific technical smart capabilities do not need to be activated when the product is placed on the market; the activation can be done at a later point of time by the consumer or a service provider. It is essential that to current standardization efforts in IEC/TC 57 work towards a level of „smartness“ that the smarter the less direct control signals are received“.	A smart device can be a s well an entire BACS that works intelligent (smart) from e.g. price signals and a strategy to optimize e.g. towards „max. use of own production“.	This type of control scheme is explicitly included and described. See ‘use case examples’ section.
1.2		te	eu.bac	Missing information on potential smart feedback from a BACS component. Imagine that a contract takes into account that information as a discount measure on the price if a smart controller would be very accurate.	A BACS component that gets triggers with a 24 h in advance pricing signal could – if implemented – give back an approximate demand curve that helps the grid to plan – as a service	Such functionality is not excluded; on the contrary. To make this explicit, in 1.5.1 we’ve adapted the list with examples of information communicated by smart appliances: “Control/status related signals from the appliance to the grid: consumption

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						information, state of the product, time to finish a cycle, expected response to DR requests or price signals, etc."
1.3.1	para 4	te	ANEC /BEU C1	New technologies like smart meters, smart appliances and home automation in general may offer a large choice of products and services as well as more information to consumers, yet the benefits for them are not guaranteed. It all depends on how these new technologies will be implemented and how they will be used by them. We consider very important that the study team takes into consideration **the following consumer relevant aspects when assessing the potential and impacts of smart functions on the different product categories:** - Impact on product lifetime and ability to repair. Durability and safety may be compromised through the high number of switch-off/switch-ons. Additionally, the repairability of the product might be affected as more complex technology such as electronics becomes part of the product design. We invite the study team to refer to the ongoing study on socioeconomic impacts of increased reparability that is commissioned by DG Environment. - Upgradability of the appliance is a very important aspect affecting product lifetime. In case the appliance cannot accomodate software updates the product lifetime decreases. - Interoperability of the smart appliance with other smart appliances and other elements in the Advanced Metering Infrastructure (AMI) such as smart phones and the smart metering architecture		Edited slightly. There are however many issues here which are tackled in other task reports. We have for some of the issues referred to other reports. Some more of the comments may be looked at in other reports, many of them need only a short remark.

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				(Customer Energy Manager (CEM), Home energy management). - Product design that offers privacy protection and privacy enhancing settings as default *(privacy by design and by default)* must be ensured both for the smart appliance as well as the connection / communication channel between the smart appliance and other connected devices mentioned above. Compliance with the data protection framework and effective enforcement must be ensured and the customer must have the right to access and control all the data generated by the smart meter and other smart devices at home. Each party requesting the data should provide justification why the data is needed and the data should not be used for purposes which are incompatible with those that justify its collection. - Regarding user comfort and impact, the appliance should be easy to operate for all consumer groups including the elderly, people with disabilities, etc. A plug-and-play approach can be a good solution. - Presentation of information: The display should provide understandable and consumer relevant information such as for example on energy consumption. It would be convenient for consumers if information is also provided via the central home management to the in-home display. The smart appliance should therefore support the communication of relevant information to the consumer interface, i.e. an in-home display or energy management gateway. - Potential health and safety risks should also be assessed by the study team including risks from		

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				increased exposure to radio frequency emissions which could have detrimental health impacts especially for the elderly, children and people with electromagnetic hyper sensitivity. - Financial benefits and costs: The (financial) benefits from using smart appliance should outweigh the costs related to the purchase, installation and –if needed- upgrade of the smart appliance. Consumers should be provided with clear information and should be adequately rewarded for their flexibility. Product lifetime must be part of the cost consideration.		
1.3.1	para 4	te	ANEC /BEUC	Display: - If the smart appliance has a display, then it should be a simple yet visually appealing display. The display should have an accessible and ergonomic design as suggested by studies (Consumer Focus, Smart meter in-home display design, 2012 DIN Consumer Council, Study on usability and ergonomics of smart meters, 2011). In its most basic, default condition the display must be readable by the consumer at a moderate distance (e.g. 1 meter). - Also features for people with a disability should be foreseen. For instance, blind and visually impaired persons can only use the smart appliance if it has a speech/audio function or can connect to one.		It is not within scope to deal with these very detailed areas such as how the display should be. Furthermore, in most cases displays if any would be part of the existing user interface for the appliance . We will touch a bit upon displays in the task 4 reports, but no the user aspects.
1.3/ 1.3.1	p 3 para 2		ECO DESIGN	This section mentions „the most relevant ones“ and „relevant appliances“: relevant for what?	Please clarify.	The ones with most potential for load shifting - adapted
1.3.1	p 3 para 2	ge	NVE	In addition to the sentence “….and concepts for smart appliances can be applied to all other relevant appliances.” it should be mentioned that these appliance can also be appliances outside the scope	Proposed additional text: ***Such appliances can be PV’s or EV’s that are not within the scope of the study but are relevant in a holistic approach to demand response and smart***	Change made: “….it is very important that the terminology and concepts

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				of the present study e.g. PV or EV.	***grid***	for smart appliances can be applied to all other relevant appliances, also those not in scope of this study, for instance PV installations or EV's."
1.3.1	p 3 para 3	te	NVE	Would it be possible to make a simple definition of *shifting potential* (as was done for *demand response* in section 1.2.) in order to facilitate the understanding of this term throughout the report	It might be as simple as: "Shifting potential is the potential to increase/reduce the power uptake for a certain period for a certain appliance or appliance group". Please, develop further……	OK this is done
1.3.1	p 3 para 3		RWE	A viable definition of "energy shifting potentials" is missing.		OK this is done
1.3.1	p 3 para 4, bullet point 3	te/ed	NVE	Even though a straight forward comparison of *shifting potential* cannot be made for the different product categories it might be possible to present the data (numbers) in a more clear format e.g. a table form in order the reader can understand the size of the potential	Appliance group: sfgsfgsdfgsdfg Shifting potential: Xx GWh Period (per cycle, per day, per year etc.): per day Season (Winter, Spring/Autumn, Summer, All year): All year Reference countries: EU28 + NO + CH Reference year: 2010 Methodology elements (technical, economical, behavioural): Technical + economical + behavioural	This is done in Task 3
1.3.1	p 3 para 4	te	eu.bac	Energy shifting - Both functions might apply - depending on the situation	Energy shifting and peak demand shifting	Made clearer in new part on technical and economic context. Peak shifting will be handled in Task 5
1.3.1	p 4 para 2	ge	EHI	Heating appliances are not periodical appliances nor		Heating appliances were not

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				are they continuous appliances, because the heating season is limited to about 7 of 12 months depending on the region within Europe. Because heat generation and distribution is a rather slow process as a matter of thermal capacity of heat transmitters and the building, interruption or shifting of operation is possible. This also applies to circulator pumps.		considered nor periodical nor continuous. They have their own category “HVAC”
1.3.1	p 4 para 2	ge	EPEE	In 1.2, page 3 para 4 it is stated that focus is […] also on appliances used in commercial sectors (e.g. commercial refrigeration appliances).	Include commercial refrigeration under the list of HVAC equipment	It is handled as subcategory of refrigeration products
1.3.1	p 4 par 2		ATG	Correctly water heaters are listed within household appliances, as continuous. This is the main profile However it should be reminded that: - in some Member States electric storage water heaters do not operate continuously but rather during the night period, with a periodical profile. - Electric instantaneous water heaters cannot be listed as continuous, as their operations depend on consumer choice to tap water. The performance flexibility of storage WH is common with deep freezers (however deep freezers are usually operated continuously) and is of the highest relevance in terms of DR . Instantaneous WH should be listed as „periodical“ and could be assimilated to AirCo. These characteristics should be reflected in the text by splitting the continuous category in two sub categories or at least by adding a foot note	Household appliances: - Periodical appliances: Dishwashers, washing machines, tumble dryers and washer dryers; - Continuous appliances: Refrigerators, **instantaneous WH**; - **F**~~f~~reezers and **storage** water heaters; - Behavioral appliances: Electrical hobs, ovens, hoods and vacuum cleaners;	adapted
1.3.2		ge	CECED	CECED asks for information and clarity on the origin of the figures used as reference for setting the scope of the study. Indeed, several inaccuracies were pointed out by CECED members.		Please point out the specific inaccuracies
1.3.2	p 4	ed	CLASP	Many statements are made in the text without proper references to the sources to substantiate these estimates.	Please add references.	

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Ecodesign Preparatory study on Smart Appliances

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1.3.2	p 4 para 5 Periodical appliances Numbered list	ge	Daikin	Start time delay controlled by user can be 'smart' because it may demonstrate smart behaviour induced by for example smart tariffs.	Consider start time delay as 'smart'.	It is not considered 'smart' within the study because it is not automated as per the definition of smart appliances (1.3.1). We agree that the action of the user would be smart, but the smartness is not part of the device.
1.3.2	pp 4-5	ge	CECED	Lack of supporting data or information on the origin of the analysis	Appliances in this category offer a high energy shifting capacity and a limited power modulation capacity. Studies indicate that around 30% of the configurations of washing machines and tumble dryers can be with remote activation. For dishwashers this is 56%. Depending on the study, the average length of the time window for remote activation varies from 3 to 8h	Source of information has been provided (LINEAR project)
1.3.2	pp 4-11	ge	Daikin	Estimates of future energy saving potentials of appliances should be benchmarked towards EPBD directive (nZEB). Since the implementation of EPBD will lead to buildings with lower energy consumption, the DR potential of future buildings will be lower.		Potential impacts from the EPBD directive will be included in the study, either qualitatively or quantitatively
1.3.2	p 5 para 2 line 1	ed	ECO DESIGN	The term „Flexibility" is introduced for the first time, without explaining what the term means in the context of this report.	Clarify the term „Flexibility"	See revised 'definition' section.
1.3.2	p 5 para 2		RWE	According to our experiences (e.g. Project E-DeMa) consumers still raise concerns about external "steering" of their smart appliances.	1.3.2	Text has been adapted accordingly
1.3.2	p 5 para 3	ge	CECED	Lack of supporting data or information on the origin of the analysis	It is estimated that about 20 % of dishwashers, 10 % of washing machines and 30 % of tumble dryers may be operated in altered consumption pattern mode	Handled in Task 3 Source of information has been provided (Smart-A project)
1.3.2	p 5 para 4 Continuous	ge	Daikin	'Consumer's acceptance is assumed to be rather high if food safety and quality is not compromised and if		Handled in Task 3

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	appliances: last para			there is no loss of comfort.' However, who is responsible in case the food safety and quality is compromised or in case of loss of comfort. General principle: liability should be considered clearly throughout the whole study.		
1.3.2	p 5 para 6	te	CECAPI	The figures cannot be precise, so don't mention them with 3 significative numbers	Replace the numbers by: An energy shifting potential of washing machines of about **5** GWh was calculated. For trumble dyers, it is between **3** and **10** GWh and for dishwaters, it amounts to **8** GWh	Figures have been changed as proposed
1.3.2	p 5 para 6	ge	CLASP	By taking into account all households in Europe, an energy shifting potential of washing machines of about 4.86 GWh was calculated. For tumble dryers, it is between 3.03 and 9.47 GWh and for dishwashers, it amounts to 8.17 GWh." These figures don't give a clear idea of what it means in terms of management of the peaks. Would be good to have figures in terms of power shift but also – as mentioned above – a background section describing the needs of the network, and ideally some information on how the potential DRM improvement geographically match the stress on the network.	Please add peak capacity (MW) impacts of smart appliance measures to better quantify the benefits.	This will be handled in Task 5
1.3.2	p 5 para 7	te	BDEW	Continuous household appliances: Refrigerators, freezers and water heaters	Continuous household appliances: Refrigerators, freezers and water heaters **(except instantaneous water heaters)**	Instantaneous water heaters are now listed as behavioural appliance
1.3.2	p 5 para 10		ATG	As mentioned previously the flexibility of fridges, freezers and water heaters cannot be reduced to a single pattern. It is proposed to highlight the dependence from appliance storage capacity. It is unclear on which basis high seasonality of WH is determined. In Winter the water temperature gap is higher but in summer the overall water consumption is higher. The two effects compensate each other and reduce the	For appliances in this category, flexibility **depends on the thermal storage capacity. In first instance it may be considered a**~~i~~s evenly distributed throughout the day and throughout the week. Whereas for refrigerators and freezers, seasonal effects are only weak~~, water heater loads are highly seasonal with highest potential occurring in winter~~.	Concerning the dependence on thermal storage capacity, the proposed amendments have been accepted. In view of WH, there is evidence of higher hot water consumption in winter. Together with a higher

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				seasonality of the WH load profile.		difference in water temperature, this results in a seasonality. Explanation has been added to the text.
1.3.2	p 5	te	eu.bac	The part depending on the appliance/application is missing.	Depending on the application/appliance a delay can INCREASE its consumption (e.g. washing machine – knitting) however if local production is optimized and stored an application might loose up to 3.8% of its capacity. The overall efficiency might shrink!	done
1.3.2	p 6 para 4 point 2	te	CLASP	„Remote activation: the user selected program is remotely activated before the user deadline is reached" This option could be unsafe for ovens and hobs, and is unlikely to be applied to hoods and vacuum cleaners.	Please clarify which appliances the options will apply to (e.g., create an appliance – option matrix?).	Remote activation is deleted
1.3.2	p 6 para 7	ge	CECED	Lack of supporting data or information on the origin of the analysis	Concerning hobs and ovens, it can be assumed that short term interruptions of heating phases or prolongation of the interval between two heating phases by seconds or minutes will not compromise the cooking process and consequently the performance. Nevertheless, the consumer's acceptance is supposed to be low."	To the best of our knowledge, there are no information available on the impact of short term interruptions of hobs and ovens on food quality. The text was accordingly adopted
1.3.2	p 6	te	EHI	Hybrid heating systems are growing in the market as a consequence of measures taken by the Energy Related Products Directive. Nevertheless these systems have a good growth potential which may be further encouraged by suitable legislative measures. Once in place, they allow for switching between two heat generating sources (heat pump and non-electric boiler). The switching potential is high. We would like to emphasize that for these systems there is no shortcoming for the user as long as changing the heat source follows a least cost approach. If that can be implemented into the overall concept, no user acceptance restriction would have to be expected.	*'Heating (electrical and hybrid)'*	Comment is relevant for Task 3

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1.3.2	p 7 para 1	ge	EPEE	During peak times should be added. Shifting to gas or fuel will just lead to higher CO2 emissions.	Change bullet point to: 'Energy source shift during peak times for hybrid gas or fuel electric heat pumps…'	Done
1.3.2	p 7 para 2	te	Daikin	The advantages and limitations of the use of a smart thermostat for DR control of a heat pump are not clear from the report. To our knowledge, today, smart thermostats cannot realize DR on heat pumps in a modulated way. The current potential for heat pump control is only on/off. Moreover, it should be noted that the use of temperature shift for DR is far from optimal to guarantee a result on energy consumption.	Clarify the current possibilities and limitations of the use of a smart thermostat for the modulated control of heat pumps.	Done. Paragraph rephrased, limitations of DR controllers regarding modulated heat pumps added. Paragraph 2, page 10.
1.3.2	p7 para 2 line 3	te	ECO DESIGN	Smart thermostats (e.g., Nest, Tado) are separate equipment for monitoring and controlling traditional boilers, electric radiators, and heat pumps. As such these heating devices are not „smart appliances" themselves, so the DR potential discussed here is questionable: it is not intrinsic to these appliances as such, it is enabled though a separate device, namely the thermostat.	Revise this text.	Text revised, generic controls added to the sentence. Paragraph 2, page 10.
1.3.2	p 7 para 2		EHI	Stand-alone heat pumps include for example air to air types, for which load reduction or load shifting will immediately be recognized by the user, because there is no balancing thermal capacity in the direct path of heat transmission.	Insert new paragraph: *Electrical heat pumps allow for load reduction or load shifting unless the user comfort gets compromised.*	Comfort paragraph is already included in page 10, paragraph 5.
1.3.2	p 7 para 2	ge	EPEE	To reduce the power consumption is the main purpose, and the temperature control is just only one of the item to reduce the power consumption,		Already included in "more advanced control systems". Page 10, paragraph 2.
1.3.2	p 7 para 2	te	eu.bac	Residential heating controls (NEST & TADO)	Refer to generic control functions covered under smart heating controls	Done.
1.3.2	p 7 para 4 line 6	ed	ECO DESIGN	„comfort degradation"	The word degradation might not be needed. Please revise whole sentence.	Replaced by the word "variations". Page 10, paragraph 4.
1.3.2	p 7 para 5 (just before „ventilation")	te	CECAPI	Note explaining that this active energy management is even more efficient in tertiary building than in residential	Introduce Note = the estimated potential is by far higher than for any other type of smart appliance. It requires a good coordination between the	Modification to be added is unclear: «Such an active energy management will

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					different thermostats and with the other appliances to get the best in efficiency. Such an active energy management will optimize locally and present a single interface to the DR. This is even more true for tertiary building, with an even bigger potential (in savings and in peak shavings)	optimize locally and present a single interface to the DR." Potential larger in tertiary sector: no or limited data to sustain this statement.
1.3.2	p 7 para 5	ed	ECO DESIGN	Is this explanation about comfort, with this level of detail needed here?	Please consider deleting this paragraph.	Sentence suppressed "More than 2K/h ..."
1.3.2	p 7 para 5	te	eu.bac	Heat pre-charging – it eventually needs more energy (kWh) in order to fulfil its demand.	Pre-charging is exactly what's mentioned in the preceding paragraph.	Modification required is unclear
1.3.2	p 7 last paragraph	ed	ECO DESIGN	Best available technologies include....	With respect to what?	Reference to Ecodesign ENER Lot 10 and ENTR Lot 6. Page 11, paragraph 2
1.3.2	p 7	ge	EHI	Beyond the approach of load reduction which tries to avoid load peaks there is also the option of making use of supply peaks e.g. from PV contribution and storing this energy for later use. This idea seems to be missing from concepts that focus on shifting, reducing or shedding of loads. The Power to Heat approach would be suitable to absorb supply peaks. For example systems with a storage tank which feature an electrical heating device in addition to hot water provided by a conventional system based on fossil fuel and allow the use electricity as an alternative to heat the fluid in the storage tank. This system can also operate with great flexibility within the boundary of the storage capacity built into the system. An approach rewarding the user could also determine the user's decision about the sizing of the storage capacity.	New bullet after "Energy Source shift for hybrid…" • Power to Heat concepts to absorb power supply peaks can for example be achieved by electrical heaters inside storage tanks of hydraulic heating systems. Switching to electrical heating has no restrictions for the user.	Armines [Product categories – DR Potential of Appliances - Electric heating]
1.3.2	p 8 para 9, Air conditioning	ge	Daikin	The definition of an air conditioner and a heat pump used in the report corresponds to the general interpretation of Ecodesign. However, from a technical point of view an air conditioner is in many	Clearly define air conditioner and heat pump in the report.	Done. Air conditioner definition established using a heat pump principle. Footnote page 12.

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				cases based on heat pump technology. That is why we propose to clearly define an air conditioner and a heat pump in the report.		
1.3.2	p 8 para 10	ge	Daikin	It should be noted that most of the air conditioners can be equipped with demand response capability by adding a network adaptor or a centralized controller. Lot 33 should request such a capability of adding a centralized controller or network adaptor as an interface to a listed protocol.	The appliance which has the capability of adding a centralized controller or network adaptor as an interface to a listed protocol is regarded as being Lot 33 compatible. This appliance should have Lot 33 requested functions. Suggestion 1: mandatory issue could be simple, similar to the once mentioned in the Australian standard (AS4755). Suggestion 2: the level of demand response capability could be described based on supported functionalities like in (draft of) ISO/IEC TS62950 (Section 5).	Rephrased paragraphs that include Daikin's remarks: Page 12, paragraphs 2 and 4.
1.3.2	p 8	ge	EPEE	In 1.2, page 3 para 4 it is stated that focus is […] also on appliances used in commercial sectors (e.g. commercial refrigeration appliances).	Include sub-chapter on commercial refrigeration	Commercial refrigeration is to be included in continuous appliances, under refrigerators and freezers category.
1.3.2	p 9 para 2	ge	CECED	Lack of supporting data or information on the origin of the analysis	It is believed that about 15% of all electric cooling appliances are equipped with the communication and control functionality to support demand response.	Suppressed 15% from the paragraph. Paragraph rephrased. Page 12, paragraph 4.
1.3.2	p 9 para 2	te	CECAPI	The communication can be direct through internet, but can also be indirect through a Customer Energy Manager (CEM)	Delete internet in the sentence: "…They could also provide ~~internet~~ communication…"	Done.
1.3.2	p 9 para 2	ge	Daikin	Limiting factor is not only user comfort. It is sometimes related to human health, e.g. in hospital.		Armines [Product categories – DR Potential of Appliances – Air Conditioning]

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Ecodesign Preparatory study on Smart Appliances

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1.3.2	p 9 para 2	ge	EPEE	To reduce the power consumption is the main purpose, and the temperature control is just only one of the item to reduce the power consumption,		Armines [Product categories – DR Potential of Appliances - Electric heating]
1.3.2	p 9 para 2	ge	EPEE	The shifting potential is not only dependent on user comfort but also on other technical demands.	Potential reduction in user comfort is not the main limiting factor as there are other technical demands in the case of server rooms, laboratories or commercial buildings for instance.	Other constraints above comfort have been added for non residential sector. Page 12, paragraph 4.
1.3.2	p 9 para 3	ed	CLASP	"Peak power: Up to about 200 GW (2010) but probably not more than 160 GW even in case of extreme events." This sentence is unclear.	Please clarify which of the two figures should be retained.	160 GW only, because of standard oversizing practices.
1.3.2	p 9 para 5	te	CLASP	„The latter need extra (physical) adaptations, which in the light of the 'low' selling prices of these appliances, could be relative expensive." Could a „smart power strip" be considered?		Added ". An alternative could be the usage of general purpose smart power adapters, but then the control logic is part of the adapter and not the end device."
1.3.2	p 9 para 5 line 3	ed	ECO DESIGN	Network facilities –> what does this mean?	Functionalities?	Changed to : network communication support
1.3.2	p 9 para 6, 7 and 8	ed	ECO DESIGN	Poorly written paragraphs	Please consider reviewing these texts.	This is adapted in the new version
1.3.2	p 9 para 8	te	Daikin	The current advantages and limitations of the use of a smart thermostat for DR control of a heat pump are not clear from the report. To our knowledge, today, smart thermostats are not able to make modulated DR for air conditioning systems. The use of a smart thermostat for DR control of a heat pump could be listed as a 'Best Not Available Technologies'.	Clarify the current possibilities and limitations of the use of a smart thermostat for the modulated control of air conditioning.	Done. Paragraph rephrased, limitations of DR controllers regarding modulated heat pumps added. Paragraph 2, page 10.

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1.3.2	p 9 last para	te	eu.bac	Large battery storage systems	These units could be controlled through a BACS logic that optimizes along a given strategy ("kWh, €, CO2…) and this leads to switching.	Added "These units could be controlled through a control logic that optimizes along a given strategy ("kWh, €, CO2…)."
1.3.2	p 10 para 3	te	eu.bac	The potential of both systems is very limited at this moment - unclear conclusion.	A "prosumer concept" strategy does not necessarily need storage for 24 h)	Conclusion removed. The potential for both is already described in the paragraphs.
1.3.2	p 10 para 5		ATG	We acknowledge that transport is not part of the ecodesign and label directives. However battery charging systems for electric vehicles are relevant whenever we consider the evolution of Demand and the potential of Demand Response (ref. Page 2 paragr. 1	Because transport is not part of the ecodesign and energy labeling framework directives, battery charging systems for electric vehicles can not be included in implementing measures. **However it should be brought in mind that the expansion of electric transport will entail a modification of the load curve, especially in the night period**	Added "However it should be noted that the expansion of electric transport will entail a modification of the load curve, especially in the night period."
1.3.2	p 10 para 8	te	CECAPI	Not only LED and tungsten light can be dimmed, and the lighting efficiency is not reduced. Dimming brings value in comfort, allow energy savings and can increase the lifetime of the lights.	Delete „~~Mainly LED an,d tunsten light systems can be dimmed and mostly with reduction in lighting efficiency~~" to be replaced by „Many light technologies can be dimmed (tungsten , halogen, fluorescent, LED…), bringing value in comfort and potentially energy savings by delivering the just enough light needed, while increasing life time."	We have edited the text. At least incandescent light bulbs will have reduction in efficiency (ie. 50 % light reduction saves less than 50 % electricity). But due to the shift to LEDs (with more a less linear relation between light output and power), this is removed from the text.
1.3.2	p 10, p 35 and following	ge	ENEA	„Street lighting is typically highly controlled and professional procured, and only few savings would be possible to achieve with more information feedback.". Lacking info on street lighting	The energy saving potential for street lighting related to adaptive lighting should be investigated and added.	The purpose of the section (and of the project as a whole) is not to calculate energy saving potential related to adaptive lighting, but in relation to demand

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						response.
1.3.2	p 11 para 1	te	eu.bac	Single appliance is a sub-optimal structure and suitable for easy and straight decisions. In the case of more equipment, complex relations among equipment (appliances) occur which leads to a different conclusion. We recommend to segregate among the 2 basic cases and not extrapolate from one to the other.	The conclusion should differentiate among “single appliance” behaviour or BACS strategic behaviour.	For the purpose of this section, it is necessary to look into the single appliances, because eventually a possible regulation would cover individual appliances. In specific use situations, may be connected to a central energy manager. Text has been added to explain this
1.3.2	p 11 para 1 and 2	ed	ECODESIGN	Poorly written paragraphs	Please consider reviewing these texts.	
1.3.2	p 11 para 5	te	CLASP	Beyond comfort issues it would seem that dimming or switching off light sources could create safety issues. These are not mentioned in the draft report.	Please discuss how safety issues are being taken into account.	This is considered part of the user impact. Text is slightly edited.
1.3.2	p 11 para 6 1st bullet point		ATG	Only storage water heaters/boilers//heat pumps can provide high flexibility with no or few performance impact.	High flexibility potential with few comfort and/or performance impacts: Dishwashers, washing machines, washer dryers, **storage** water heaters, radiators, boilers, heat pumps, circulators, residential and non-residential air conditioners and battery storage systems;	The ambiguity has been removed by adding the adverb ‘buffered’.
1.3.2	p 11 para 6 1st bullet point	te	BDEW	High flexibility potential with few comfort and/or performance impacts: Dishwashers, washing machines, washer dryers, water heaters **(except instantaneous water heaters)**, …		The ambiguity has been removed by adding the adverb ‘buffered’.
1.3.2	p 11 para 7	ge	Daikin	Air conditioning is categorized as with high flexibility potential and few comfort impact like washing machines	Suggestion: Assess accurately impact of air conditioning on comfort. Assess safety aspect of	Heat waves constraints

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				which is not correct. The impact of the heat waves was dramatic some years ago.	heatwave.	paragraphed added. Page 12 paragraph 5.
1.3.2		te	eu.bac	The bullet list only mentions use cases where the supplier own the optimization module. The optimization is kept towards energy or peak limiting, however the most major methodology to drive consumption is a variable price.	In case of a BACS knowing the upcoming schedule of the building, the climate conditions and the status of storage units and having a 24h / 15 Min price signal, the optimization of the operation among that intended schedule	See the BACS example in the footnote added to 1.5.2.
1.3.3	p 12 para 3		ATG	This statement is correct from a technical point of view, but it assumes that there is no need of feedback from a market standpoint. This is not correct in principle	This type of demand response differentiates itself, as no communication is required from the smart appliance to the outside world**, from a purely technical standpoint**.	Text adapted as suggested.
1.3.3	p 12 para 3, line 5	ed	ECO DESIGN	Safe for the system frequency, these are typically....	Unclear sentence, please revise this text.	"With exception of the system frequency, these are typically grid parameters that reflect the state of the local distribution grid."
1.3.3	p12 para 4/5		ATG	The assessment of advantages and disadvantages is biased. The fact that extra communication links are redundant depends on the business model that is applied. But the fact that the appliance cannot participate to other DR schemes does not diminish its value on a DR market. Therefore the presence of absence of an extra communication link does not influence the value of the FC on the service market. We propose to cancel the reference to the costs as we should assess the value of the service	System frequency control based on smart appliances with local measurements has a number of advantages and disadvantages. The strongest advantage is that extra communication links are **technically** redundant. ~~Costs are avoided,~~ N~~n~~o privacy issues emerge and uptake is not hindered for people who lack affinity with networked technology. On the other hand, the appliance must be equipped with extra measurements. They also cannot participate to other DR schemes, unless extra communications are established.~~, which forfeits a lot of the advantages.~~ **In case no extra communication link is made available, an additional**~~A~~ distinct difficulty ~~due to the lack of a communication channel~~, is that the DR contribution of the appliance cannot	We make no claims on the market value of the flexibility, but only state that the absence of communication infrastructure does avoid the cost of that communication infrastructure. No changes made.

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					be easily measured, nor verified. As such, simple and transparent compensation mechanisms are hard to establish. Nevertheless, because of the many advantages of frequency control based on local measurements, system frequency control remains a viable DR option.	
1.3.3	p 12 para 5	te	CECAPI	The compensation mechanism can be easily managed by the change of tarification as it is done in France for years for example	Delete "~~As such, simple and transparent compensation mechanisms are hard to establish~~" and replace by "The compensation mechanism can be done through the meter with variable tariff depending on the period"	It is not known beforehand when and how much frequency containment and restoration reserve activation is required. Activation is in the timeframe of seconds to minutes. In other words, using tarification schemes would require changes to the tarification after the events with a resolution of seconds. They would then still apply to the entire household consumption and not only to the reserves activated by the changes in the frequency. Frequency reserves are typically remunerated using reservation and activation fees. The French Option Tempo variable pricing scheme is not suited to reliably remunerate frequency reserves.
1.3.3	p 12 para 5	te	CECAPI		Insert after …viable option "largely used in some countries for many years"	We have no knowledge of end-user residential applications participating to the frequency reserves, by

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						means of local frequency measurements.
1.3.3	p 12 para 5	te	ECOS	While it is true that SFC contribution to DR would be difficult to verify and compensate in the same manner of other DR schemes, a number of other means of compensation for the provision of demand-side flexibility exist. This could include a discount on the price of an appliance, for example. Section 1.7.2 does detail incentives for end-users, but the type of incentive per DR-technique could be attributed clearly.	Clearly attribute compensation schemes that can feasibly be provided to consumer's owning a SFC-enabled appliance	Following footnote has been added to 1.3.3: "Probably the most practical remuneration scheme for system frequency control is a simple capacity fee in the form of single time bonus when the appliance is purchased, or a fixed annual reduction to the energy bill. Biggest drawback of such schemes is that the fee has no relation to the effective capacity made available to the frequency reserves."
1.3.3	p 12 para 5	ge	EPEE	System frequency control may be adapted for household appliances but not necessarily for commercial air conditioners and heat pumps and should therefore not be mandatory.	System frequency control should not be mandatory	No text modification required.
1.3.3	p 12 para 6	ge	EPEE	A mandatory approach would limit innovation and flexibility	We support that the mandatory deployment is no longer envisaged	No text changes required.
1.3.3	p 12 last para		ATG	If, in principle, TSOs can establish different technical specifications and modify the min time, in order to preserve the value of the investment done by consumers, it is not enough to encode the specifications in the appliance, it is necessary that the appliance can recognise the synchronous area it is plugged in and there should be a possibility to upgrade the already installed DR appliances.	As technical specifications (deadband width, nominal frequency/voltage/…, etc.) depend for the moment on the specific needs of the local TSO, these need to be **harmonised for being** programmed in the appliance. **In case they are not harmonised, appliances should be able to recognise the TSO they depend for supply and slect the appropriate set of technical specifications to be followed.** **Appliance programming should be upgradable in case TSOs modify their technical**	This falls outside the scope of this study and is taken up in the framework of the Demand Connection Code

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					specifications.	
1.3.3	p 12		RWE	Frequency is not a “local” grid parameter, but constant throughout the grid system.		Following change has been made to remove the ambiguity: “where smart appliances locally measure a grid parameter”
1.3.3	p 12	te	CLASP	This option has considerable advantages in terms of acceptability and data privacy but there is nothing quantified in this chapter, which makes it difficult to compare the potential of this option to others.	Please quantify the potential impacts (i.e., benefits) of this option.	Suggestions are welcomed how to quantify advantages in terms of acceptability and data privacy.
1.3.3	p 12	ed	CLASP	First mention in the report of the „Network Code on Demand Connection“, but the text lacks a description to clarify what it is or who is involved.	Please add a footnote to describe this activity with a hyperlink for more information and/or a reference.	The following footnote has been added: "[1] See the site of ENTSO-e for more information: www.entsoe.eu "
1.3.3	p 12	ge	ECOS	It is not clear why System Frequency Control is a ‘special case‘. Will appliances utilising this DR technique be subject to the same assessment criteria under the ‘Horizontal Approach‘ in 1.3.1? It is also not clear under which appliances the technique will be considered.	Detail the assessment criteria SFC will be examined under. Remove ‘special case‘– a fair, and neutral, assessment of available DR technologies should be a core principle of the preparatory study.	removed
1.3.3	p 12	ge	CECED	Reactive appliances should be distinguished from smart appliances. Smart appliances and reactive appliances represent two very different industrial and regulatory challenges		Although we do use a different terminology, this statement is precisely why we added 1.3.3.
1.4	p 13	ge	CLASP	Will one of the future chapters cover the environmental impacts of starting up additional generating units? This impacts question should ideally be considered at a Member State/local level. It is difficult to understand the benefits of smart appliances without first having a clear picture of the current state, needs and planned development of the energy network.	Please address environmental impacts of starting up additional generating units in this or a future chapter. Please clarify the Member State level situation with regard to the energy network.	This will be covered in task 5

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1.4	p 13		RWE	In paragraph 1.4 any considerations in respect of the impacts of the “use-cases” on the distribution grid level and local bottlenecks is missing. Furthermore, it is not seen that in the "red light" phase the DSO must be able to override the signals of other market partners due to system security.		Additional use case was added
1.4.1	p 13 para 5	ge	EPEE	Completely switching off heat pumps would first of all have a negative impact on the efficiency of the products and secondly have an impact on the user pattern, which is of key importance in the HVACR sector, not only because of comfort but because of other technical demands in laboratories or industrial applications for instance.	Heat pumps should not be completely switched off but rather run at 20% for instance	This is just an illustrative case study in the residential sector. The mentioned technical constraints should be reminded for further tasks in case non residential base cases are built.
1.4.1	p 13 para 6	ge	EPEE	To have sufficient heat to be stored, “oversized” heat pumps shall be stored to heat up more the building or water compared with normal usage, when receiving the Demand Response.	The limited impact should not be over-simplified	Modification required is unclear
1.4.1	p 13	te	NVE	In relation to grid congestion management there is another relevant use case: With limited grid capacity per household, load management may take place within the individual building by prioritizing the loads. This will be relevant e.g. when adding new flexible loads like EV’s. For example when an induction hub is turned on in the evening (high load), the EV charger should stop charging until the induction hub is turned off again. This can be handled by a Home Energy Controller/load controller e.g. up against fixed or dynamic capacity restrictions send by system operators, aggregators etc.	It is proposed to add an additional use case example: **Use case example 1c: Grid congestion related on-site load management of smart appliances**	Additional use case was added
1.4.2	p 14	ge	CECAPI	It is explained in the previous pages that the possible shift is small and that most of it can already be done with the existing solutions	Delete 1.4.2 as a use-case	Do ‘existing solutions’ refer to manually configuring the start time in function of the prices? If so, then pilots have shown that this only works if the pricing scheme is very simple and stable. As soon as more complexity is added (e.g.,

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						more tariff blocks that vary day to day), and the user would have to consult those prices before configuring the appliance, then manual configuration is no longer sufficient.
1.4.2	p. 14	ge	CLASP	This option may not represent a significantly higher potential than a start-time delay coupled with good information/tariffs for consumers. Questions like these should be studied in subsequent Tasks.		See previous reply
1.4.3	p 14 para 5		ATG	As TSOs can fix their own frequency technical specifications, it is important that the appliance recognise the valid specifications to be followed. It is therefore needed that there is at least some communication to the appliance, when it is plugged in. Communication from the appliance may be needed from a business standpoint in order to assess the level of service provided (unless only the capacity is taken into account) It is proposed to delete the sentence	This type of DR is based on internal measurements and control: The appliance is equipped with power measurements (e.g., frequency and voltage) and it switches or modulates its electricity consumption in function of those measurements. ~~This type of control requires no communication to or from the appliance.~~	The remarks are valid, but are discussed in detail in 1.3.3.
1.4.3	p 14	ge	EPEE	In 1.2, page 3 para 4 it is stated that focus is […] also on appliances used in commercial sectors (e.g. commercial refrigeration appliances).	Add a use case example for commercial refrigeration (EPEE can provide one)	Additional use case was added
1.5	pp 14-23	ge	CECED	CECED identified a number of important misconceptions in this section dedicated to interoperability and gaps. CECED strongly advises the consultants to focus on communications architecture already elaborated and agreed, such as the Smart Grid Coordination Group reference developed through the standardisation mandate M490. The key element of that architecture is the Customer Energy Manager (CEM), which is a logical function that can potentially be integrated in different devices (home energy gateway, smart meter, or smart		Adaptation of the text is made and Figure 1 was deleted

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				appliance) or even through the cloud. The CEM plays the role of logical interface between the home (smart appliances) and outside the home (service providers, suppliers, aggregators,…). All the actors involved in the development of smart grids have agreed to this infrastructure illustrated p.28 of the report. Substantial work has been done (notably by CECED). CECED calls for avoiding duplication of work. Focusing on the M490 architecture would narrow down the spectrum of the study to focus on concrete challenges and achievable goals. Focusing on the CEM model would mean basing the development of smart appliances on the work accomplished until now by the smart grid community. Working on a new architecture for that study would be inefficient and not take into account the current dynamic cooperation of stakeholders involved in smart grids and smart appliances. In the frame of that architecture model, CECED calls for a technology agnostic approach.		
1.5	p 14		RWE	According to the aforementioned *(comment of RWE regarding Section 1.4, p. 13)*, the DSO is completely missing in all statements concerning the interoperability aspect. The idea of a "pre-qualification" of facilities (to thereby avoid potential local problems) seems also to be unknown.		From the scope summary: "The focus of this study is on the smart appliances and the potential flexibility generated, independent of how this flexibility is used in a specific energy market structure. A range of DR business cases and energy markets should be supported that is as wide as possible. This study is not about market design, i.e.

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						what market structure or business cases are to be preferred." In line with this statement, DSO pre-qualifications, traffic light systems, (day-ahead) validations of nominations, or any other mechanisms to safeguard the distribution grid from the new stochastics introduced by DR, are out of scope of the study. However, the functionality, supported by smart appliances, must be so, that such mechanisms can be supported.
1.5.1		te	ANEC /BEUC	The study should investigate the impact of smart functions to the energy consumption of appliances, which can be affected by the increase of switch-off/switch-ons as well as their permanent stand-by status. We would also recommend to assess if/how smart functions affect the energy efficiency of smart appliances.		This is not part of interoperability and gaps, but part of task 4.
1.5.1	p 14 para 1	ed	ESMIG	Since the (change in) consumption has to be measured according the applicable tariff scheme in order for the consumer to be rewarded for his flexibility, the link with the AMI is also important (see information to be exchanged indicated by EG3 in its specification of the recommendation: "Timely access to data while ensuring consumer privacy").	Update as: the link between the individual appliance and the supply side (BRP, aggregator, energy efficiency service provider etc.) via a home energy manager or internet/cloud systems, and the AMI	Text has been added, however, with the addition "in some cases", because the remuneration may also be via capacity flexibility.
1.5.1	p 14 para 6	te	ANEC /BEUC	Interoperability amongst smart appliances – including those of other manufacturers – is a core condition for consumer engagement. Interoperability would allow households to accomodate appliances of different	Proposed addition: Interoperability amongst smart appliances – including those of other manufacturers – must be	Text has been added, slightly modified compared to the proposal

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				manufacturers. This does not only create a level-playing field for manufacturers and faciliates competition but also prevents that consumers find themselves locked-in and forced to use products of a single company.	ensured. The smart appliance should be interoperable and communicate with/to other elements in the AMI such as the in-home display, smart phone and the smart metering architecture (CEM, Home energy management).	
1.5.1	p 14 para 6	ge	EHI	Many appliances also in the field of heating do have communication capabilities. They have mostly been provided to establish a link to service organizations, the manufacturer of the equipment or the user for remote control of parameters. Demand response communication would requires defined interfaces and data structures, which – to our understanding – are being developed. Communication to be handled via central home energy management units or building automation units requires those products to be made compatible for the purpose of this lot's target, too. This goes on top of communication requirements coming from the system integration side (Nest, HomeKit etc. or Bacnet etc.).	"1.5.1 For the purpose of this report interoperability is understood as the link between the individual appliance and the supply side (BRP, aggregator, energy efficiency service provider etc.) either directly via internet/cloud systems or via a separate device (home energy manager) to make it possible to achieve a better balancing of energy generation and energy consumption within the grid."	The internet/cloud system is also an energy manager, so we do not agree that this is a more direct control of the appliance. No change here.
1.5.1	pp 14-15		ATG	Portability and upgradability of the DR capability is as important than long-term spare parts availability.	When comparing the available technical solutions, the extensibility **and upgradability** of the system, the compatibility with other systems (of different manufactures and brands), the long-term availability of spare parts and operation security are important criteria, which influence this decision.	We agree. Text is added
1.5.1	p 15 para 4	ge	EPEE	Completely switching off heat pumps would first of all have a negative impact on the efficiency of the products and secondly have an impact on the user pattern, which is of key importance in the HVACR sector, not only because of comfort but because of other technical demands in laboratories or industrial applications for instance. Also in the non-residential air conditioning systems and commercial refrigeration, there is already centralized controller which is controlling the each product even with the total power consumption of the system. So with those system having centralized controller, the signal should not	Remove stop signals, an aggregator should send consumption reduction signals Add the words of "centralized controller". "E.g. an aggregator should be able to send stop signals and delayed start signals to 100,000 heat	Agreed. "Stop signals" removed, "centralized controller" added.

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				be send to the product directly, but to be send to the centralized controller.	pumps or centralized controller which is controlling the pumps in a given Member State."	
1.5.1	p 15 para 4	ge	JBCE	In the case of non-residential air conditioning systems, manufacturers already use a centralized controller which is controlling each product without compromising the comfort of users and at the same time achieving energy savings. Therefore, in the case of these systems with a centralized controller, the signal should not be sent directly to the product, but to the centralized controller.	Add the words "centralized controller". "E.g. an aggregator should be able to send stop signals and delayed start signals to 100,000 heat pumps or *centralized controller* which is controlling the pumps in a given Member State."	Agreed. Corrections made.
1.5.1	p 15 para 5	ge	ESMIG	Please include reference to the M490 flexibility architecture that is shown later in the document. The architectures are conflicting: the Consumer Energy Management System is missing. A Smart Meter will not communicate with an appliance directly.	Please indicate that the architectures in this document may be conflicting and have to be aligned.	The figure is thought as giving an overview of the communication. The connection between appliance and meter is due to the electricity consumption, i.e. the meter meters the appliance's consumption. However, the text and figure has been removed.
1.5.1	p 15 para 5	ge	ESMIG	Why per appliance? The Smart Meter will give total consumption, that is important for the Aggregator / BRP.	Correct the text	Text and figure have been removed
1.5.1	p 15 para 6	ge	ESMIG	Consumer flexibility remuneration can happen through the tariff or a capacity and/or activation fee - based on total consumption	Add: based on total consumption	Text and figure have been removed
1.5.1	p 15 last para	te	CECAPI	The right period for the measurement of the electricity consumption of the appliance depends on the amount of energy at stake.	Replace "for each quarter of an hour" by "for the appropriate period depending on the savings at stake"	Text and figure have been removed
1.5.1	p 15 last para		ATG	Measuring consumption every quarter of an hour may represent a limitation for some type of DR services ((e.g. FC). It is proposed to cancel the reference to a fixed	The appliance electricity consumption is measured ~~for each quarter of an hour of the day~~ and the data is transferred to the electricity retailer. The	Text and figure have been removed

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				lapse of time.	consumer pays for the electricity used with the relevant time-of-use tariff or a flat rate. Consumer flexibility remuneration can happen through the tariff or a capacity and/or activation fee.	
1.5.1	p 15 last para	ge	Daikin	'The appliance energy consumption is measured' –> How is this measured. Does every device need a separate electricity meter? Other solutions can be considered, such as using one external electricity meter for several appliances that run during different time intervals.		Text and figure have been removed
1.5.1	p 16 fig 1		RWE	The presentation is based on purely market-serving flexibility. Interests and technical systems of DSO are lacking as well as of the TSO. The same applies for fig.2 at page 17.		Text and figure have been removed
1.5.1 + 1.6.2	p 16 fig 1 p 17 fig 7	te	ANEC /BEU C	Does architecture depicting the communication transfers in figure 1 refer to the Advanced Metering Infrastructure (AMI) of the CEN-CLC-ETSI Smart Grid Coordination Group, mentioned in figure 7? The figure 1 shows a direct connection between the appliance and the smart meter, whereas in the AMI the connection goes via the HEG. We invite the study team to assess whether: - the smart appliance will be connected to the in-home display (via EMG and H2+H1 interface in the AMI) - and whether information about energy consumption of smart appliance will be sent to the in-home display.		Figure 1 removed, text adapted
1.5.1	p16 para 1 after fig 1	ed	ECO DESI GN	„..Figure 5 details....." The text explaining this figure is poorly written.	Shall be Figure 2 and not 5. Revise the text explaining Figure 2.	Done
1.5.1	p 16 para 1	ed	EPEE	N/A	Figure 2 instead of 5	Done
1.5.1	p 16 last	te	Daikin	Encoding is not the same as mapping. Mapping refers to	Delete: '(also called mapping)'.	Text has been edited.

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	para			a change in data model (for example between HEG and appliance), while encoding refers to the process of putting a message into a code for efficient transfer.		
1.5.1	p 17	ge	Daikin	Lot 33 should define the interface between aggregator and smart appliances or home controller (Application layer, in Figure 2 represented by the vertical line between 'house' and 'internet'). This interface should be technology agnostic and listed in an international standard. When the appliance includes the HEMS/BEMS function the appliance should support this interface. For the information layer and communication layer several protocols and communication media should be allowed. To facilitate the use and spreading of these protocols an overview of all industry relevant present or future communication protocol/technology could be provided, for example, SEP2.0, EEBUS over IP, BACNET, ECHONET Lite.	Lot 33 should define the Application layer, and choose one standard. Recommended Application layer is OpenADR, when considering export of EU products to other countries. For the information layer and communication layer several protocols and communication media should be allowed.	This is still to clarify. For the purpose of this report, we are not using the OSI model. No change.
1.5.1	p 17	ge	EPEE	The application layer should be technology agnostic and be able to map on the below layer(s) (information-communication) of all industry relevant present or future communication protocols/technologies.	Figure 2 should be defined according to the OSI layer model.	This is still to clarify. For the purpose of this report, we are not using the OSI model. No change.
1.5.1	p 17	ge	ESMIG	Refer to the ESO Standards here	Refer to the ESO Standards	We refer to standard in other places of the report and it would be too detailed to refering to them here as well.
1.5.1	p 17 2nd bullet point	ge	ESMIG	"control signals from the grid"? This channel has not been included in the architecture diagrams.	Include channel to the grid in the architecture diagrams	By "the grid" is meant "aggregator". Text is edited.
1.5.1	p 17	ge	JBCE	Examples of information content include information signals from the appliance to the grid, for example, safety/comfort/maintenance.		Safety and user aspects are dealt with separately in task 3

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				Please study safety aspects throughout the study and clarify how and by whom safety can be guaranteed.		
1.5.1	p 17 fig 2	ge	JBCE	Figure 2 is not following the wording of the OSI layer model.	Figure 2 should follow the wording and the definition of the OSI layer model.	For the purpose of this report, we are not using the OSI model. No change.
1.5.1	p 17 fig 2	ge	JBCE	Several data models and ontologies are listed in the figure. However, this list is not exhaustive. Please consider all relevant protocols.	Please avoid making non exhaustive lists of protocols. Thus, either make the list exhaustive, or do not refer to specific examples.	We believe it is not possible to make the list exhaustive and we believe it is of value for the reader to understand the text to use illustrative examples.
1.5.2	para 3	te	ANEC /BEUC	We encourage the study team to investigate how the communication or transfer of data is secured along all communication channels. If the data transfer is done through, i.e. the wifi of the household, it may only be protected by a firewall. This protection would probably be insufficient. Which security and privacy standards are in place for the connection between the internet (cloud) and the smart devices? For example, would the data be encrypted?		This is part of Task 3
1.5.2	p 18 para 3, line 4	ed	ECO DESI GN	..“There are two ways for appliances to interfere with the energy system....“	The word interfere is probably used incorrectly in this context, please revise this text.	Changed to: “there are two ways for appliances to interact with the energy system”
1.5.2	p 18 para 4	ed	ESMI G	“which today is often not yet the case” - Claim is not substantiated: The functionality of meters is driven by MS and not limited by technology	Update as: “which today is not everywhere mandated by the national regulator”	Changed to: " which is often not yet the case for the current installed base. Also, adapted regulation would be required in many member states."

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1.5.2	p 18 last para	te	CECAPI		Insert: "The cloud architecture makes every appliance reacting itself to grid stimuli, without optimizing the energy consumption / consumption profile at the home level nor reacting differently in a degraded mode (with energy restriction to save the grid for example). The centralized architecture makes the local optimization easy and allow the consumer to define its own priorities in case of need to reduce the energy currently used.	Don't agree: the location of the optimization intelligence (local or in the cloud) has no fixed link to local optimization being supported or not.
1.5.2	p 19 fig 3	ed	ECO DESIGN	.."Figure 3: two types of interfaces"	Please provide a better caption for this figure.	Changed to: "The two communication architectures: left the central energy manager model, right the cloud model."
1.5.2	p 19 para 2		ATG	It is important that interoperability boxes enable the M2M interface in full respect of the M2U (machine to user) interaction in terms of expected performances	The tools and data models can subsequently be applied by the industry to produce ETSI M2M compliant devices, or interoperability boxes to make existing, non-ETSI-M2M devices interwork with an ETSI M2M system~~.~~**, while ensuring the fulfilment of user's expectations in terms of performances.**	Added sentence.
1.5.2	p 19 last para	ed	ECO DESIGN	This paragraph is repeated twice.	Delete repeated paragraph.	Done
1.5.2	p 20 para 8	te	CECAPI	The document still mentions gaps, however giving no evidence of such communication architecture gaps there is no evidence that gaps are remaining	TC 205 and TC 59 are currently working on an data model communication architecture and will soon deliver output	Text slightly edited, but there is still no one data model.
1.5.2	p 20 last para	te	ANEC /BEUC	The last paragraph notes: *„There are a large number of architecture initiatives aiming at achieving one data model and communication architecture standard. However, there is a risk that there*		The use of standards by manufacturer is voluntary, unless it is referred to by legislation.

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				are parallel activities taking place in some areas and lack of activities in other areas." In order to prevent the risk of parallel communication models and architectures and in order to ensure interoperability, we should consider one communication architecture, which has been developed and agreed through a consensus-based approach.		Recommendations have to be formulated in task 7, not in task 1.
1.5.3	p 19 para 1	te	ANEC /BEU C	The first paragraph notes: *„Note that a smart appliance may be equipped with the functionality to be interoperable to multiple of these approaches."* We would like to strengthen this requirement and recommend that smart appliances are capable of being interoperable to the multiple approaches mentioned in the report.		Comment relates to Task 7
1.5.3	p 19 para 1	te	ANEC /BEU C	Users have to be in control of their appliances. A direct control should not be imposed from outside the house, if the user does not agree with it. The ultimate right to override any programme is of paramount importance for consumers, especially for those, who find themselves in urgent need to switch on/off a certain device.	Proposed addition: Consumer should retain control and always be able to override any programme.	Adapted sentence: "From the point of view of the smart appliance, 3 approaches exist to establish control of the smart appliances, <u>within the comfort limits set by and agreed upon with the user</u> and in function of the demand response objective."
1.5.3	p 21 para 2	te	CLAS P	„This implies updates of the control systems, but not of the installed smart appliances." As the software managing the smart appliance will need to be periodically updated, there should be a mechanism to make sure that consumers having invested in a smart appliance don't have to choose between signing new terms and conditions that they wouldn't agree with and using the smart features of their appliance.	Please discuss firmware updates for smart appliances, and how consumer rights over terms and conditions will be protected.	Part of Task 3

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1.5.3	pp 21-22		RWE	In paragraph 1.5.3 there are no considerations in respect of emergency actions by the DSO/TSO – The "external objectives" mentioned in that paragraph are not the most critical topics in our view.		'Objectives' as used in the text is a container term for all possible demand response objectives, including grid congestion emergency actions by DSO or TSO. E.g., the objective could be 'ensure that the voltage does not exceed nominal voltage +/- 10%'.
1.5.3	p 22 para 4	te	CECAPI	Control architecture gaps -the current statement internal and external control work are considered in the standardization (See figure 7) -sometimes internal or external control is more efficient which depends on the application	Delete the last 3 statements: "If the external control and external objectives model is to be supported, additional work is required to define broadly applicable generic flexibility interfaces for the smart appliances. If the internal control and external objectives model is to be supported, additional work is required to define what control a smart appliance should at least support and how the objectives for each control case are formatted. If the internal control and internal objectives model is to be supported, additional work is required to define what control a smart appliance should at least support."	The comments are not contradicting the 3 referred statements.
1.5.3		te	CLASP	We would suggest that this section should include a paragraph on data privacy and the implications of each type of architecture.	Please add a paragraph on data privacy as it relates to each type of architecture.	Part of Task 3
1.5.4	p 23 para 2	ed	ECODESIGN	This paragraph fits better under „Appliance gaps"	Consider moving the text under the section „Appliance gaps"	Text moved.
1.5.4	p 22 bullet point 1	ge	Daikin	Request for clarification. What is meant by: 'This module should have always on live connection.' What is meant by always? On live?	Please use a correct technical term for „on live	Text removed, it may not be necessary with permanent

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						connection
1.5.4	p 22 para 9 bullet point 1	te	ECO DESIGN	This module should have always on live connection.	Please use a correct technical term for „on live connection“. Moreover, is this statement really true?	See above
1.5.4	p 22 para 9	ge	EPEE	The aim is to develop common language for interoperability not to prescribe design options. These should be left to the manufacturers	Don’t be too prescriptive in terms of re-designing products, i.e. chip.	Agree, text removed.
1.5.4	p 23 para 3	te	CECAPI	appliance gaps appliance is taken into account by TC 59	Add : “appliance is taken into account by TC 59”	Text is edited.
1.5.4	p 23 para 3, line 1,2	ed	ECO DESIGN	...“There is a need for development for the individual manufacturers, however common architecture standards for the information and the communication layer, the gaps should be minor.“	This text is not clear, please consider revising it.	Agree, text is edited.
1.5.5	p 23 para 4, line 1	ed	ECO DESIGN	...„The communication carrier from the end-user (home, office, etc) and office is mainly the internet.“	What office? Unclear sentence, please consider revising it.	Text is edited.
1.5.5	p 23 para 6	te	Daikin	Zigbee, WiFi and Bluetooth are also RF. This makes the inclusion of RF redundant.	Delete: ‘RF’.	Text is edited.
1.5.5	p 23 para 6	ge	Daikin	A multitude of communication carriers is described. What is the advantage of including non-IP based communication carriers?		This is included because these communication carriers are already being seen on the market. Furthermore, there are important differences in the energy consumption, where many non-IP protocols consume less energy. Text is added
1.5.6	p 23	ed, te	ECO DESIGN		In Section 1.1 under Task 1 Scope (on page 1 of this report) it says…”Smart appliances/meters are part of the Commision´s work plan 2012-2014,..”. The report though is only focusing on smart appliances. Nevertheless, in section 1.5.6 there	The text is for information only. A remark has been added.

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					could be a better explanation of why smart meters are included in this report, particularly in the section of interoperability and gaps. It could explain what approach is taken, in general, for smart meters in this preparatory study, and then address the interoperability issues.	
1.5.6	p 24 para 1	te	ECO DESI GN	..., however, not for the transmission of the communication signals between the demand and the supply side.“	Is this correct? Please check Figures 6 and especially Figure 7, where a simple external consumer display is presumably connected to a smart meter.	Text is added for explanations. The displays connected to the smart meters are not part of the communication signals between demand and supply side.
1.5.6	p 24 para 1	te	ESMI G	“however, not for the transmission of the communication signals between the demand and the supply side.”: Claim is not correct: The Network operator will set consumption/generation limits that the CEMS need to work with	Update as: The smart meters are assumed to continue to be important for the main metering and payment of the energy delivered, and the transmission of information between the demand and supply side.	We changed into the following: The smart meters are assumed to continue to be important for the main metering and payment of the energy delivered, and can support the transmission of DR relevant information like for instance consumption/generation limits between the demand and supply side.
1.5.6	p 24 para 2	ed	CLAS P	„The smart meter roll-out is ongoing in most EU Member States, however, not always with the full set of necessary functionalities in place.” It is unclear what these necessary functionalities are - the sentence in the paragraph before this statement states that Smart Meters will not be important "for the transmission of the communication signals between the demand and the supply side".	Please clarify what the necessary functionalities are and the role of Smart Meters.	Text is edited.

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1.5.6	p 24 para 2	ed	ECO DESI GN	.."The smart meter roll-out is ongoing in most EU Member states, however, not always with the full set of necessary functionalities in place".	Please revise this whole paragraph, make it clearer: ….*with the full set of necessary functionalities* -> for what? A reference for such a statement is missing.	text is edited
1.5.6	p 24 para 2	ge	ESMI G	"The smart meter roll-out is ongoing in most EU Member States, however, not always with the full set of necessary functionalities in place" – Reference should be made to the survey performed in SGTF Expert Group 1 on Smart Meter functionalities. This survey shows that at least the consumer focused functionalities are in place in a clear majority of the member states	Please refer to the Interoperability and Functionality survey performed by SGTF EG1 in Q1-Q2 2015.	1 main issue is lack of 2 ways communication.
1.5.6	p 24		RWE	End of paragraph 1.5: The separation of metering point operators, suppliers and similar market roles (grid operation, supplier, customer) is still required due to IT security and data protection taking into account the ownership structure of appliances and transfer points to be discussed.		Information received, no changes.
1.5.6	p 24	te	ECOS	The work of the EC Smart Grid Task Force Expert Group 1 'Interoperability' has now completed the Smart Meter gap analysis of Member States. This information should be reflected, to some degree, in this report. A main finding of the work was that the application of EU standards, allowing interoperability with other DR-enabled devices across H2 and H3 interfaces is not complete, with an unclear picture of harmonised data formats and models. In addition, a large majority of Member States have not implemented H2 and H3 interfaces on Smart Meters rollouts. Further, a number of Member States have instead opted to provide energy consumption information to consumers over PLC with a web interface (with no possibility to transfer data within the home), for which no standardised API exists within the EU. This is a serious interoperability gap.	Reflect the findings of the EC Smart Grid Task Force Expert Group 1 'Interoperability' in this report – detailing the lack of standards and interoperability between the Smart Meter and other DR-enabled devices across EU Member States. Further, detail the impact this lack of interoperability will have on the establishment of Smart Appliances and what measures could be taken to overcome such obstacles.	Smart meters are in scope only for additional energy consumption and therefore we should not include many details on smart meters.

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1.6	p 24	ge	JBCE	There are several international standards (IS) in this area such as EEBUS and KNX. ECHONETLite, IEC standard, should be placed as same as them so that over one million air conditioners are speaking ECHONETLite.		ECHONET lite is mentioned in the Standards Japan section. Please provide info on worldwide usage.
1.6.1	p 25 last two bullet points	te	ECO DESIGN	Are these two Codes already EU regulations in force? Or shall these be included under a separate section?		Put in separate section on policy context
1.6.2	p 26 para 3 line 1		ECO DESIGN	The text shows: Error! Reference source not found.	Figure 4?, and possibly include a better caption text for Figure 4.	Text has been adapted accordingly.
1.6.2	p 27 para 1 line 4		ECO DESIGN	The text shows: Error! Reference source not found.	Figure 5?, and possibly include a better caption text for Figure 5	Text has been adapted .
1.6.2	p 29 para 1 line 1	ed	ECO DESIGN	..“in the above Figure...“	Please introduce Figure 6 instead. Possibly include a better caption text for Figure 6.	Reference added, but caption text is the text used in the referred document.
1.6.2	p 29 fig 7	te	ECOS	There are a number of factually incorrect aspects to this diagram – a thorough examination of the standards and their capabilities would be useful, for example: CLC/TC 205: prEN 50491-12 does NOT cover the H2/H3 interface; instead it covers the interface between the CEM to the HBES/Smart Devices. IEC, CLC TC 13: 62056 does NOT cover the H3 interface. Moreover, the standard series contains only requirements for the data link layer and application layer of the H2 interface.	Reassess the flexibility functional architecture and accurately reflect the state of European standardisation, concerning the communication between the smart meter and the energy management gateway. It is not clear to ECOS how the provision of DR intends to operate in Europe without a comprehensive set of fully-featured standards across Member States that would avoid market fragmentation.	Figure has been changed

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				In addition, it is not clear whether the prEN 50491-12 standard and the EN 62056 standard share the same data models.		
1.6.2	p 29 para 4 line 1	ed	ECO DESIGN		Please introduce Figure 7.	Done
1.6.2	p 29 para 4 line 1		ECO DESIGN	The text shows: Error! Reference source not found.	Figure 7?	Done
1.6.2	p 30 para 3	ed	CENELEC TC13	IEC/TC 13 'Equipment for electrical energy measurement and load control'	The title has been changed. Correct as: IEC/TC 13 'Electrical energy measurement and control'	Text has been adapted .
1.6.2	p 30 para 4	ed	CENELEC TC13	Last sentence: The status of this standard is currently CD (Committee Draft),…	Update as: The status of this standard is currently CDV (Committee Draft for Vote),…	Text has been adapted .
1.6.2	p 30 para 4	te	Daikin	The standard developed by WG14 also includes specifications for H2 interface.		Text has been adapted
1.6.2	p 30 last para	te	CECAPI	delete the bracket "… sufficiently frequent information updates for the customer (every 15 minutes)."	Replace:"… sufficiently frequent information updates for the customer depending on the demand."	Text has been adapted .
1.6.2	p 31 para 1	te	CECAPI	delete e.g. "…profiles identified by IEC /TC 13 and CEN/TC 294."		Text has been adapted .
1.6.2	p 31 para 2	te	CECAPI	"EN 50491-11 is … expected to be available in 2015."	Replace: EN 50491-11 is published since 2015-06	Text has been adapted .
1.6.2	p 31 para 2 bullet point 1	ed	ECO DESIGN	This work item is expected to be completed by the end of 2014 and expected to be available in 2015.	Please update this text.	Text has been adapted .
1.6.2	p 31 para 3 line 1	ed	ECO DESIGN	…"The following Figure".	Please introduce Figure 8, Possibly change the title of Figure 8 to: Selection of relevant standards related to smart appliances	Text has been adapted .

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					and smart home interoperability.	
1.6.2	p 33 para 3 bullet point 1	ed	ECO DESIGN	..”To provide a standardize framework for the common ontology derived from the EC Study Group on Smart Appliances,”	Change to: Standardized Reference to the EC Study Group on Smart Appliances (?) -> Is it meant the current EU Preparatory study or another working group on smart appliances? Please clarify.	Text has been adapted .
1.6.2	P37, para 5, line 1	ed	ECO DESIGN	The text shows: Error! Reference source not found.	Figure 9?	Text has been adapted .
1.6.2	P38, para 3, bullet point 1	ed	ECO DESIGN	…”General rules of intelligentization…”	Please check, possibly the word “Intelligentization” does not exist in English.	Text has been adapted .
1.6.2	p 39 para 3 line 1	ed	ECO DESIGN	..”Dozens of consortiums, commercial…”	The plural is: Consortia.	Text has been adapted
1.6.2	p 39 fig 10	ed	ECO DESIGN	Figure 10: Standards framework of China NC	Please consider a better wording for this caption, explain NC or include in the list of acronyms.	Text has been adapted .
1.6.2	p 39 para 4 line 4	ed	ECO DESIGN	..”The trillion dollar question here is whose standards, as this will give the initiator a head start and significant advantage.”	Please consider the style of writing in this technical report and these kinds of sentences.	Text has been adapted .
1.6.2	p 40 para 6 conclusions	te	EHI	Higher integration devices have to be adapted to the data formats determined on the utility side.	Insert additional sentence: Utility communication standards would be the first to be determined as a matter of the work done by CLC/TC 205 and others.	The context of the comment is not clear.
1.6.2	p 40 para 7	te	CECAPI	Product safety standards such as IEC/EN 60335 are not the only relevant standards for safety. For HBES devices or appliance, EN50491 series establish safety, emc, and functional safety requirements.	Delete the sentence : “Smart Device Performance Standards should identify the safety issues relevant to that type of device.” Add “for networked devices or appliances, EN50491 series apply.”	Text has been adapted .
1.7	p 41 line 4	ge	CECA	The part 1.7 regarding possible market / business modes	Add this information to the paragraph: ‘ The	This comment seems not

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			PI	is welcomed and should be more developed	standard developed by WG14 also includes specifications for H2 interface.'.	relevant for the pre-conditions.
1.7	p 1 bullet list	ge	Daikin	Incentives are also a pre-condition for smart appliances and smart grids	Add 3rd bullet: 'incentives'.	Text is added.
1.7	p 41 para 2	ge	EPEE	In 1.2, page 3 para 4 it is stated that focus is […] also on appliances used in commercial sectors (e.g. commercial refrigeration appliances).	Add an example for commercial refrigeration (EPEE can provide one)	Additional use case added
1.7.1	p 41	te, ed	CLASP	„It is also worth noticing that SEDC has assessed the access for demand response providers and that there can exist demand response activities in not-open power markets performed by the national energy regulatory operators though these often would be targeted larger energy consumers such as manufacturing industry." It would be beneficial to explore and present the reasons for this choice and discuss how this option compares with a broad deployment of smart appliances at the household level – in view of the functions defined for smart appliances.	Please discuss the reasons for this choice and please edit the sentence to clarify its meaning.	Text is edited.
1.7.1	p 41	ed	ECODESIGN	Member States access to demand side resources	Please consider a better title for this section.	Text is edited
1.7.2	p 42	te	ANEC/BEUC	Participation in Demand Response schemes must be voluntary and with the control of consumers. They should always be asked for their consent to opt in and have the right to withdraw their consent given earlier. They should also have the ultimate right to override any programme without being penalised. Protection must be in place for those unable to change their consumption pattern. Consumers in vulnerable conditions should not be exposed to increased costs of peak-time energy.		Part of Task 3

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				Consumers not able to participate in such a scheme should not be penalised by higher tariffs.		
1.7.2	p 42	ge	CLASP	This section would benefit from more references to past experiences that took place in individual Member States. Some of the issues may be very similar to what is encountered with the deployment of smart meters – including for example additional costs, additional energy consumption, data privacy issues and benefits realised from the deployment.	Please add references and discussion on experience with Smart Meters.	This will be discussed more in detail and including the experiences of past deployments in T3.
1.7.2	p 42	te	CLASP	„Thereby, each increase of comfort loss requires more attractive incentives." And potentially also each increase of data sharing as it is a raising concern (cf. for example Informal Session at eceee summer study „Forced to be smart?")	Please discuss the implications of an increase in data sharing.	Part of Task 3
1.7.2	p 42	ed	ECO DESIGN		Please consider some kind of summary for the whole report at the end.	
Annex 1	p 1	ge	ECO DESIGN		Consider the previous page numbering of the main document, to be followed by the Annexes. Include numbering of the even pages.	Done
Annex 1	p 4 para 3	te	CLASP	„The total energy consumption remains the same, even if it is shifted. Energy consumed extra or less at a certain point in time must be compensated for at another time." Not necessarily - as mentioned in the body of the report and on the next page, energy consumption can be increased because of a waste of energy (e.g. in the case of an interrupted wash cycle for a washing machine or dishwasher).	Please clarify that energy consumption can also increase due to power demand interruption requests.	Text has been adapted
Annex 1	p 5 para 1	te	CLASP	By taking into account all households in Europe, the energy shifting potential of washing machines is about 4.86 GWh." This section provides very little information on the methodology behind the derivation of this estimate.	Please discuss the methodology and explain how this estimate was prepared.	Text has been adapted

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				Please explain how the results of the Smart-A and Linear projects were extrapolated, what was the baseline etc. Existing consumer information, tariffs, features of the stock of appliances etc. differ between Member States: how have these parameters been taken into account? Has the total additional consumption from additional appliances in network standby mode (and probably additional displays) been quantified and reflected in the presented estimates?		
Annex 1	p 7 para 3		ATG	Water heaters offer an additional flexibility for DR: i.e. the anticipation of demand not its postponement. This capacity is already widely used in some member states (with a rather static traditional approach)	Based on demand response control signals or power grid measurements, start of the compressor or the water heater may be delayed. **Storage water heaters may also be called to anticipate their operations for storing energy in anticipation of future use in the coming hours**	Text has been adapted
Annex 1	p 8	te	CLASP	Same comment as above on the methodology for page 5 of Annex 1. Time units of the shifting potentials should always be specified.	Please always specify Wh/kWh/GWh per day/ per year as well as per household/for Europe.	Text has been adapted where information was available. More details are foreseen in Task 3.
Annex 1	p 8 para 2	te	BDEW	Total shifting potential of water heaters? - needs clarification		There are no data available on water heaters
Annex 1	p 13	ge	EPEE	In 1.2, page 3 para 4 it is stated that focus is […] also on appliances used in commercial sectors (e.g. commercial refrigeration appliances).	Add commercial refrigeration	added
Annex 1	p 15 para 1	ed	Daikin	There is a mistake in the following sentence: 'Electricity consumption in Europe (EU27) is assumed to be around 150 TWh for the residential sector and 130 TWh for the residential sector in 2010.'	Clarify which of the two electricity consumptions relates to the residential or commercial sector.	Adapted. 150 TWh for the residential sector and 120 TWh for the non residential sector.
Annex 1	p 17 table 4	ed	ECODESIGN	Table 4 (residential only?)	Revise the texts in this table.	Changed to : most likely residential + tertiary. Table 5.
Annex 1	p 20 para 3	te, ed	CLAS	„The situation can be improved if heat pre-charging of the building is allowed, which is less energy efficient but	Te: Please consider and discuss cost implications for the end-user as well.	This will be done in further

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			P	enables to gain acceptation from the end-user point of view.“ Indeed there is a loss of energy efficiency - pro and cons of this option in terms of environmental impacts should be quantitatively evaluated by this study (although the answer will certainly depend on the energy mix and as such will be very location dependent). Potential cost implications for the end-user should also be considered.	Ed: Acceptation is not an english word, please use „acceptance“	tasks. Acceptance word changed, annex 1, page 20 (pdf document, 66 word doc)
Annex 1	p 21 para 1	ed	ECO DESI GN	The text shows: Error! Reference source not found. Table	Table 5?	Done.
Annex 1	p 21 last line	te	CLAS P	„It is important to notice that residential and tertiary units are certainly included in the estimate below.“ It would be interesting in terms of policy options to know the share of tertiary vs. residential in the energy shift potential presented in this section.	Please provide more information as to the end-use sectors influencing the energy shift potential.	New paragraph added. Page 67 of the word document (just before the shifting potential table for heating)
Annex 1	p 22	ge	ECO DESI GN	Blank page – needed?	Eliminate blank page	Done
Annex 1	p 27 fig 14	ed	Daikin	Fig14 is repeated twice.	Delete one of the two Fig 14.	Deleted
Annex 1	p 33 para 4	ed	Daikin	Conclusion Word is missing in sentence: ‘are equipped **WITH** grid communication’.	Add **WITH** to the sentence.	Done
Annex 1	p 34 para 2	te	CLAS P	„The estimated stock year 2020 based on planned Ecodesign measures is (Kemna, 2014): - LFL: Linear fluorescent lamp: 1911 million units - CFL: Compact fluorescent light: 3431 million units - Tungsten: 991 million units - GLS: General lighting service ('incandescent'): 153 million units - HID: High intensity discharge lamp: 47 million units - LED: Light emitting diode: 5482 million units	Please adjust estimated stock to reflect recent policy decisions and more recent stock estimates for Europe. See suggested sources. Please clarify the term „Tungsten stock“ and how it differs from the stock estimate of „Tungsten“.	Figures and text updated

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				- Tungsten stock: 73 million units“ Recent GfK lamp sales data (used by the IEA 4E Mapping and Benchmarking Annex for their September 2014 report, cf. also CLASP report of March 2015 http://clasp.ngo/en/Resources/Resources/PublicationLibrary/2015/New-Data-Show-that-LED-Mass-Market-in-Europe-Will-Occur-Sooner-than-Predicted.aspx) indicates that the volumes of CFLs had been over-estimated and the volumes of MV-HL had been under-estimated when assessing the impact of regulation 244/2009. Besides, stage 6 of 244/2009 has been delayed by one year and is now only due to take effect in 2018, meaning that the stock of halogen lamps in 2020 will likely be much higher than estimated in the 2014 VHK study reference here. It is unclear what is meant by „Tungsten stock“ given that „Tungsten“ lamps are already listed in the table above. Please clarify and/or consider whether it is justified to keep them separated as in the VHK report.		
Annex 1	p 36 para 3	te	CLASP	Beyond comfort issues it would seem that dimming or switching off light sources could create safety issues. These are not mentioned in the draft report.	Please describe how potential safety issues have been considered.	Text is edited.
Annex 1	p 40 para 3	ed	ECODESIGN	References for the section “chargers (low power) are missing	Please include references for the section “chargers (low power)”.	Done. References added.
Annex 1	p 42 para 3	te	CLASP	„Battery Energy Storage Systems are still in an early phase of commercialisation, so the installed base is currently very small. From its nature it has a large potential once installed in larger numbers.“ Only the potential in terms of load shifting is considered here. The potential impact in terms of total consumption, as well as other environmental aspects (use of resources) should be developed in subsequent Tasks.	Please ensure that impact on total consumption and environmental impacts (including resources) are developed and included in forthcoming Task reports.	Noted. Needs to be taken into account in the forthcoming tasks.

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Annex 2	p 43	ge	ECO DESI GN	Page numbering shows a different format at this page and onwards. Even pages are not numbered.	Revise page numbering	Done
Annex 2	p 43, line 1 after main title	ed	ECO DESI GN	…"Framework Document for the typical characterization of grid-connected building´s".	Shall be "buildings".	Text has been adapted .
Annex 2	p 47 - p 50 - p 51	ge	ECO DESI GN	Figures are not introduced in the main text, just placed under sections.	Introduce Figure 16 in p47, introduce Figure 17 in in p50, Introduce Figures 18 and 19 in pages 50 and 51.	Done
Annex 3	p 57 table 7	ed	CENE LEC TC13	FprEN 62056-1-0 'ELECTRICITY METERING DATA EXCHANGE – The DLMS/COSEM suite - Part 1-0: Smart metering standardization framework' – Sept. 2014	Update as: EN 62056-1-0 'Electricity metering data exchange – The DLMS/COSEM suite – Part 1-0: Smart metering standardization framework – Available	Text has been adapted .
Annex 3	p 57 table 7	te	CENE LEC TC13	IEC/TC13 IEC 62056-7-5 'ELECTRICITY METERING - DATA EXCHANGE FOR METER READING, TARIFF AND LOAD CONTROL - Part 21: Direct local data exchange; Amendment A: Mode D DFI interface with OBIS codes' Dec. 2015	Update as: IEC, CLC/TC 13 FprEN 62056-7-5 'Electricity metering data exchange – The DLMS/COSEM suite – Part 7-5: Local data transmission profiles for Local Networks (LN)' Mar. 2016	Text has been adapted .

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B. COMMENTS OF PRIVATE STAKEHOLDERS

a. Format

Please find below the comments of private stakeholders on the draft of the Task 1 report, using the format :

- FC = Feikes Christoph
- KS = Köppen Simon
- RS = Rank Stefan
- RK = Rohrbacher Kai
- RJ = Rudnik Jörg
- VK = Volker Korndörfer
- WD = Wolff Detlev

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General	General	ge	RK	Forcing people when they are not allowed to do their daily tasks like washing laundry, vacuum-cleaning, cooking, etc. just for energy load shifting would constitute a massive violation of the principle of proportionality, be unrealistic and contradict basic human laws of self-determination. Earlier studies state the potential for DR in residential households to ~8% of its electrical energy demand. As the residential sector in total amounts to only <30% of the electrical demand anyway, the resulting overall potential is way too small to legitimate such interventions. It is also the wrong economic approach to the underlying problem: In a market-driven world, it suffices to ensure the proper pricing of any good and the "law of supply and demand" will regulate its use automagically. Indeed, the pure fact that the EU thinks about *compulsory* measures just proofs that the current price of energy is not reflecting its actual, true value! If it were, consumers would rationally adapt THEMSELVES accordingly -w/o any legal obligation whatsoever on the demand side. For the supply side, a similar argumentation applies: If the price of electricity would reflect its true value, electricity suppliers would rush to fill in gaps with appropriate supply.	The EU has (only) to enable a functioning free market for electricity. "Free" in that regards means: - without distorted competition in prices / subsidies - enforce a technical infrastructure that enables free trade of electrical energy internationally - this especially includes a barrier-free internationally valid interface to trade energy These measures will mobilize the market forces and solve the problem far better than aiming to subject the people to another bureaucracy red tape.	
1.1	pp 1-2	ge	RJ	We reject remote activation and internet connectivity of appliances due to privacy , security , safety and cost issues. Frequency control / power line quality is ok , if benefit is shared between producer and consumer of		

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				energy.		
1.1	p 1	te	RJ	It is a logical mistake to conclude from internet availability for the houshold to network accessability for houshold appliances. Most rooms will not have wired LAN. Powerline LAN may be the obvious choice as such will increase power consumption in general and increase security , safety and radio emission issues. WLAN will open attack vectors. Network administration knowledge does not exist in the large majority of population.		
1.2	p 2 para 4	ge	FC	There is no proof stated for the supposed “tendency of decreasing classical *centralized* power”, on the contrary, politics is trying to counter decentralization!		
1.2	p 2 last bullet	ge	FC	Modification of capabilities by a “service provider”? Consent of “appliance” owner? Rollback to status quo ante?		
1.2	p 4 para 4	ge	FC	Wrong focus! Significant potential “only” in industrial applications!		
1.3.2	p 4 etc	te	VK	Nonsense. Dishwasher etc.: If it is full, it has to run, there isn’t much flexibitliy. In the night it is too noisy. We do have a reduced night tarif and never do use it for this purpose.	Delete the suggestion	
1.3.2	p 4 etc	te	VK	Nonsense: Heatings etc. are regulated by temperature. I do not want to get a cold house or a warm deep freezer just for saving some cents.	Delete the suggestion	
1.3.2	p 5 para 4	ge	KS	The expectation for customer’s acceptance as „high“ is not justified	The level for Consumer’s acceptance for remote activation, especially so for dishwashers and washing machines, has to be determined and cannot be anticipated by the authors	
1.3.2	p.5	Ge	WD	The use of appliances in the household is based on availablity and planned duration of processes. An external influence can only beaccepted on a case-by-case agreement on that external influence.		

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1.3.2	p 5 para 4	ge	FC	Consumer acceptance will only be there at all if the job is done until a consumer specified deadline.		
1.3.2	p 5 para 4	ge	FC	It's not "there can be concerns", it's "there are concerns!" There are laws / regulations concerning the usage of e.g. washing machines only under supervision and not at all at night!		
1.3.2	p 5 para 4	ge	FC	Any impact on the quality of an appliance's performance will not be accepted, something like "colour fading" will result in claims for compensation.		
1.3.2	p 6 para 7	ge	FC	"consumer's acceptance is supposed to be low." This is an understatement, isn't it?		
1.3.2	p 6	ge	RJ	We agree with DR potential for heat pumps and would accept even some regulation similar to VDE AR 4105 even without compensation scheme, if no loss of comfort occurs if not compensated.		
1.3.2	p 6 para 3	te	VK	Nonsense. These devices are used when they are needet. I do not want to wait for my meal three hours just for saving some cents.	Delete the suggestion	
1.3.2	p 6 para 9	te	VK	Nonsense: Electric heating etc. I have a heat pump, and its regulation may not be disturbed by an additional regulation (I am an electrics engineer)	Delete the suggestion	
1.3.2	p 9 para 4	te	VK	Perhaps. chargers (low power periodical). But ridiculous. If I need the battery of my DSLR loaded because I have a shooting within two hours, I do not want to disturbed by a blocked charger.	Delete the suggestion	
1.3.2	p 10 para 6	te	VK	Nonsense: Wherefrom this smart technology will know, that I am in the room reading my newspaper???	Delete the suggestion	
1.3.2	p 10 sub "lighting"	ge	FC	Suppose switching off the lighting in a staircase, and someone falls? With respect to the comparatively small power consumption of lighting installations – if we exclude Belgian highways – the possible savings don't		

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				justify the effort!		
1.3.2	p 11, sub "conclusion"	ge	FC	Regarding the remarks above, the first bullet is plain wrong, the second might be almost correct, the third is correct as far as it might be more acceptable to switch of lights rather than risking loosing electric power at all, which might be necessary for life sustaining (medical) appliances.		
1.3.3	p 12	te	FC	Please consult an electrical engineer about cost and especially **efficiency** of a scheme to manage differing frequencies in partial grids!		
1.3.3	p 12	te	RJ	The statement in 1.3.3. that the DR contribution cannot be measured is incorrect. The frequency is the same in the whole subnet , therefore both the houshold meter , the regional supplier/grid operator and a 3rd party authority (government oder auditor) can execute agreed commercial contracts within a legal framework for frequency based energy supply and consumption. Correction factors for high and low times could reviewed / changed annually similar to EEG charge in Germany to adjust to market conditions. The most complex (superset) household meter would need 6 counters : 3 for consumption (low, normal, high frequency) and 3 for supply. If net metering would be mandated for DR scenario a total of 3 , this is just one more than todays bi-directional meters in Germany. This would be fair and secure and provide plug-an-play capabilities even for installed base via add-on adapters e.g. for battery chargers of power tools. This does not restrict legislation for emergency conditions like VDE AR 4105 to be used for DR enabled appliances. Such an approach would drive a pure market based adoption with minimum cost to general society.		
1.4.1	p 13 ex 1a, last para	ge	FC	More likely: heat pump owner will be made to pay more, if she doesn't agree to imposed "flexibility".		

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1.4.1	p 13	ed	RJ	Example 1a: Supported today by PV inverters with digital output plus “smart grid ready” labeled heatpump.		
~~1.5.1~~	~~p.25~~	te	RJ	The text is either logically flawed or intentionally deceptive. The requirement to able to stop 100000 heat pumps does not imply a capability of the heat pumps to communicate with the supply. This is easily shown to be wrong, because many heat pumps and other electric heating systems in Germany can be remote controlled today by the regional grid operator. Same is true for newly installed PV systems. Frequency control would be another way to achieve this, the technology exists but is not employed on the consumption side.		The part referred to serves as an example only. It has been deleted to avoid any ambiguity.
1.5.1	p 15	ge	WD	Data transfer in 15 min intervals generates full access to current energy consumption by device. This massive data collection infringes on my right of privacy and informational control. This could only be an opt-in project.		
1.5.2	p 18 para 2	ed	FC	Spelling of “architecture”		
1.5.2	p 19 para 3	ed	FC	What’s “interwork?” You might want “interoperability.”		Text has been adapted.
1.5.2	p 19 bottom	ed	FC	Last and second to last paragraphs are identical.		Done
1.5.2	p 20 para 3, 4	ed	FC	“grouped style” doesn’t look so good here!		Done
1.5.3	p 20, last sentence	ed	FC	Should read “… to be interoperable with a multitude of these approaches.”		Multitude implies a large number. We propose only three.
1.5.3	p 21 para 4	ed	FC	Should read “… or a cloud based system.”		Sentence adapted: “Control objectives can be sent to the smart appliances both using the home energy gateway model or using the

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						cloud model."
1.5.4	p 22 para 9 bullet 1	te	FC	PLC is only acceptable if PLC's RF frequency pollution is eliminated. Most PLC installations only survive, until someone complains, thereafter they can only be operated, when a violation of existing law is tolerated by the "authorities."		
1.5.4	p 22 para 9 bullet 4	ed	FC	Spelling of "light" in last sentence		
1.5.4	p 23 para 1	ed	FC	Spelling of "complete", should read "complete platform" w/o the word "design"		
1.5.4	p 23 para 2	ed	FC	Should read "… such that the demand control system **does** not need …"		
1.5.4	p 23 para 2	ed	FC	How do you "maximize a guarantee?" "end consumers" plural, not genitive!		
1.5.4	p 23 para 3	ed	FC	Did you want to write: "There is a need …, however, **given** common architecture …?"		
1.5.5	p 29	te	RJ	This figure probably ignores secondary housing like holiday houses, garden houses etc. many of those have electricity and at least a freeze protection heating, but no internet.		
1.5.6	p 23	Ge	RJ	Smart meter rollout appears to be driven by lobby interests (see https://www.pwc.de/de/energiewirtschaft/assets/studie-smart-metering-final.pdf) , not for public benefit. http://smart-energy.blog.de/2010/08/24/capgemini-studie-flaechendeckenden-roll-out-smart-meter-oesterreich-9240005/ ; http://www.bmwi.de/BMWi/Redaktion/PDF/Publikationen/Studien/kosten-nutzen-analyse-fuer-flaechendeckenden-einsatz-intelligenterzaehler.pdf		

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1.6.1	p 24 para 3 bullet 3	ed	FC	"is of outmost importance" should be "is of the utmost importance"		Done
1.6.1	p 25 bullet 7	ed	FC	… non-**discriminatory** manner …		
1.6.1	p 25 bullet 8	te	RS	• "Member states shall ensure the removal of those incentives in network tariffs that are detrimetral to energy efficiency and might hamper demand response." This paragraph is very passive and does not support proactive energy efficient tariffs.	• "Member states shall ensure the removal of those incentives in network tariffs that are detrimetral to energy efficiency and might hamper demand response." • "Member states shall ensure that national energy regulatory authorities introduce energy efficient tariffs to prosumers/ customers. These tariffs shall offer realtime energy production fees resp. network supply earnings to the end prosumer/customer in dependence on realtime under- resp. energy overproduction in network." This additional paragraph will enforce the end user to adapt his energy consumption / network supply (e.g. PV mCHP, wind) to the needs of network and would gain the network efficiency a lot.	
1.7	p 41	Ge	RJ	The technique of deliberately providing an incomplete enumeration of options is well known for any kind of deceptive opinion influence attempt. Therefore the scientific value of such documents goes close to zero, since this is obviously content controlled by some interest groups. Remote control of energy usage is not a pre-condition of DR. Apparently there is an interest to suppress certain alternatives and let remote control appear as "no choice" option.		
1.7.2	p 42	ge	FC	I happen to live in Germany. As a private customer, I'm paying (at least) three times the price for electricity compared to an industrial customer, even if the price at the Leipzig electricity stock exchange is **negative**.		

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				Without a **substantial reduction** of overall cost **none** of your schemes is **acceptable**. If the goal is a better management of the distribution network, private “consuming only” households shouldn’t be the target of your studies.You should look into improving managing “prosumers” and the consumption of industrial customers.		
Annex 3	p 91, “battery storage systems”	te	RK	This section forgets to take the „efficiency factor“ into account: the conversion loss to store & fetch energy into batteries will decrease the potential savings of energy. In addition, also the ecological & energy-wise footprint of batteries themselves must be taken into account: It takes (a lot!) of energy to create batteries and again a lot of energy to recycle them correctly at the end of their lifetime. These effects lack in your calculation, you falsely assume "brutto" == "netto".	Correct the energy savings potential by a respective discount.	

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b. E-mail

The following private stakeholders commented by mail on the draft of the Task 1 report :

for Rheinische Friedrich-Wilhelms-Universität Bonn

- Gipp Siegfried:
  Comments about smart appliances in private house.
  It is not possible to plan the usage of most appliances in private house. This is only possible for appliances that do not need human attention. As far as I see there are only 2 appliances where such a smart on/off would be possible: Washing machines and dishes cleaner. Both run for some time without any human attention. Both need to complete their run, once started. Any other appliance needs human attention and thus can not be planned by other than the human user.
  Any heating units do not need human attention, too. But these depend on weather and the current needs in the house. So these could not be planned either.
  I'd be interested in such an appliance, but only if I could choose which to connect to this feature, and if power is guaranteed until the once switched on device runs. Interrupted runs for these machines is not acceptable.

- Dörfler Helmut:
  Some generally comments on the study "Preparatory study on Smart Appliances, Task 1 Scope":
  Despite of the danger of the improvement for third parties to spy everything in the private household and the people who are living in this household (from third parties), I have great concerns about the following topics:
  - Where is the consumption saving of all this, when I need so much devices to control all and to connect with internet instead of a passive current counter?
  - Who will be responsible for the infrastructure in the household and who will administrate it? The consumer itself? The normal consumer won't be able to do that.
  - Who will care for the security? Does every consumer have to be a security specialist, or has he to pay for administration then?
  - What when the infrastructure of the consumer is hacked, who is responsible for damage; and if you read and hear news, everything is getting hacked, if there's a will; no software is free of errors, and the complexer the software the more errors it has.
  - Does the consumer have to change the hardware, let's say every three to four years, because of security concerns?
  - And last but not least, who will in the end pay for all these infrastructure?

  So, my conclusion is: there's no need for such a complex infrastructure from the consumer's side and in the end there's no saving, neither in energy nor in money for households.

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