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Position Paper on Lot 33 Task 7 Report

Summary

APPLiA represents the home appliance sector in Europe. Our sector is a promoter of energy smart appliances and Demand Response technologies in Europe and has historically supported Ecodesign regulations. We thank the study team for the revised versions of the reports and for having taken into account some of our remarks. APPLiA appreciates the recommendation of the consultant to confirm the selection of SAREF4ENER ontology as the reference for the common data model. In general, we support solutions that are meaningful for all stakeholders, consumers being central and should be considered first and foremost. We therefore welcome this new opportunity to provide our feedback on the Task 7 Report released in October 2018. Please find below our detailed analysis and suggestions.

1. General commnents

1.1. Definitions

It is crucial to apply one, single definition of energy smart appliance throughout all legislations and studies. We very much welcome the distinction that has been made between the different control architectures (i.e. direct flexibility interface, indirect flexibility interface and internal measurement interface), as it clearly separates those products with capabilities for two-way communication with the external world, able to understand and react to external input (the energy smart appliances) and products able to read frequency on the power line in real-time and react accordingly, shifting on or off based on the frequency value (i.e. frequency control). This distinction is not just important for technical reasons, but also because these different kinds of products interact in a completely different way with the end consumer and will deliver value to different actors in the energy system. We therefore strongly support the fact that the internal measurement interface has been moved out of scope of the study.

APPLiA would like to recall the definition of an energy smart applaince in Regulation (EU) 2017/1369. The definition of energy smart appliance in the Final Report Task 7 includes also examples of local measurements such as "mainly voltage and frequency" which is abundant and might be confusing. We would therefore suggest removing this part.

1.2. Use cases and standards

We would like to highlight taking into consideration use cases when defining requirements as a positive aspect of the Task 7. Our industry has contributued to define the these use cases for Demand Response capable products, and those have been standardised by CEN/CENELEC and ETSI, within the broader list of Smart Grid use cases (such as load shifting to reduce consumption at peak time and smart start to use lower tariff or green energy). As recognised in the report, any future regulatory process should consider these cases when defining the required product functionalities.

1.3. Evaluated benefts

APPLiA believes that the presented monetary value and forecasted benefits of Energy Smart Appliances are not an accurate representation of the market. The presentation in the study penalises certain appliances while overestimating others. Home Appliances are already highly energy efficient products. Therefore, the monetary value received from the Energy Smart Appliances is not necessarily

very high. Nevertheless, we believe that the study undervalues the benefits that Energy Smart Appliances can deliver, both for energy consumption and for financial savings.
This can be demonstrated by Electric Storage Water Heaters, some of which are continuously heated, while others are heated overnight (i.e. night storage). The values presented in the report are only realistic for continuously heated water heaters. For water heaters that are heated overnight, the maximal average shifting time can easily reach three to five hours, without any impact on consumer comfort. Due to this unrealistic calculation, the conclusions are inherently underestimated. The study did not consider the benefits that could be gained from technology shifts – for example, shifting from continuously heated water heaters to night storage water heaters. So, while the rationale for the energy benefits delivered by Energy Smart Appliances presented in the study is agreeable, this is not the case for the quantification of the savings gained by the different appliances.
Another example includes instantaneous water heaters that are considered to be smart home appliances. Depending on the model, they might reduce water flow rate or water temperature depending on power limits; they also might communicate to other appliances to reduce peak energy demands (for example to switch off an electric room heating while taking a shower or a cooker while using hot water in the kitchen). They also might have a remote control to set up required temperature during shower, might inform user on his/her individual energy consumption directly after or even while using it and are able to storage and display the energy consumption from the last tapping and/or an average energy usage by day, week, month and so on.

Following the previous points on Evaluated benefits, APPLiA believes that both night storages and instantaneous water heaters should be included in the scope of proposal for a possible future Energy smart icon.

1.4. An Energy Smart Label, not mandatory requirements

APPLiA welcomes the study's recommendation for a smart icon on the Energy Label as the preferred policy instrument. The smart icon, as opposed to minimum Ecodesign requirements, has the potential to stimulate the market uptake of Energy Smart Appliances in a positive way. In contrast, minimum Ecodesign requirements – even if applied only for those product categories with a relatively high flexibility potential, as suggested by some Member States – would not be favourable to consumers.

Consumers would not be motivated to learn and understand what the Energy Smart functionality is, or how it would need to be activated to help the electric grid. As a result, they would not benefit financially from the Energy Smart functionality inside the appliances they purchased. On the other hand, the additional electronics needed for the functionality have a cost, which would ultimately be financed by the consumer.
The most sensitive consumers may be discriminated by a mandatory approach. Some consumers choose not to have internet connection at home or cannot afford an internet connection. If this means the Energy Smart functionality could not be made operational, these consumers would be forced to finance additional technology in appliances, while it would not be of any use for them, nor would it be useful for balancing the electric grid. The additional cost for this group of consumers, of a mandatory approach, would be significant as electromechanical products could no longer be sold. If Energy Smart functionality would become mandatory, only products with electronic control could be sold. This product segment would have a much higher additional cost to become connected than what has been shown in the study, as all controls of the appliance would have to be electronic to make the product connected.

Therefore, market demand needs to drive the evolution towards Energy Smart Appliances. Creating the right market conditions to make consumers demand Energy Smart Appliances would be the most efficient, fastest and balanced way to gradually establish an installed base of products that could support Demand Response. Consumer demand would push the industry to compete and to improve the products in terms of cost and performances, to meet the demand of the consumers.

1.5. On strategic decisions

Consultant recommendation: Energy smart appliances should be able to function with and without the presence of a local energy controller

We would like to ask for clarification on this point. Technically, it is not possible to use both options at once. We mainly volatge and frequency therefore suggest rewording the obligation as follows: *Energy smart appliance should be equipped with a technology that can communicate/operate with a controller either locally or externally.*

Consultant recommendation: Energy smart appliance should be able to receive instructions from a controller inside and outside the customer home network

We support the principle behind this statement however we believe it should be phrased as follows: *Energy smart appliance should be able to communicate to a controller regardless if the controller is inside or outside of the customer home network.* The choice should be left to the consumer to adapt for his own architecture. Requiring ability to communicate both externally and internally will require additional software/hardware in the controller without being used systemically by the end user. The appliance should be able to communicate externally or internally, and this functionality can be extended to cover both if the customer choses.

1.6. Energy smart icon

The Energy Smart icon needs to ensure the visibility of the product on the market in the sense that it is ready to communicate in terms of Demand Side Flexibility. A simple symbol should be sufficient and chosen in such a way that it is transparent and easy to understand for consumers. If any wording would be suggested for the icon, we suggest being in line with the wording that is used in the study, i.e. Energy Smart.
Providing one icon to indicate that a product is Energy Smart would provide the most clarity for consumers: if an appliance is Energy Smart, it will have an Energy Smart icon on the Energy Label or added in the Ecodesign information requirements. If the appliance is not Energy Smart, the appliance will simply not have an icon. If there is no Energy Smart icon on the appliance, it inherently means that the product is not Energy Smart.

HVAC products usually consist of different components that may or may not be Energy Smart. However, even if the individual components are not Energy Smart, they may become Energy Smart when they are put together and become the assembled appliance. For this, the present market reality and diversity need to be carefully considered.

It should be possible to promote a set of components complying with the requirements of an Energy Smart Appliance as being Energy Smart, and the Energy Smart icon must be able to clearly inform the consumer about the smart possibilities of the set, and to promote the Energy Smartness of the product as a whole. This already exists in the Ecodesign and Energy Labelling Regulation for Lot 1 products, where not only an individual component is considered, but also the set, and Energy Labels are described for "packaged" appliances. A set of components that form an Energy Smart Appliance can consist of an incremental number of parts and can even be combined with cloud applications.

Lastly, to avoid any confusion, it would be best to introduce an Energy Smart icon only at the date of revision of the Energy Label, on a product by product basis.

1.7. Vertical approach

APPLiA welcomes the suggested vertical approach of the study, as it considers the fundamental different nature of the products involved and we encourage policy-makers to follow this recommended approach Depending on the product, the approach for Demand Side Flexibility is different. We therefore support that the horizontal requirements are applied only where possible, to keep the necessary freedom for different innovative solutions that can be adapted to specific product needs and opportunities.

Furthermore, we believe that over-specification of the requirements for the Energy Smart icon needs to be avoided, since this can hamper innovation in a fast-moving market. Detailed requirements may be specified in standardisation, where technological changes can be followed more efficiently. An example of a Technical Committee engaged in this work is CENELEC TC59X. In addition, to avoid double or contradictory regulation, additional technical requirements that are already covered by other legislation (for example related to cybersecurity or privacy) do not need to be covered in the requirements for Energy Smart Appliances.

1.8. External controllers

Regarding the thermal appliances group, we are concerned about the consultant's final suggestion not to consider appliances with external controllers ('controller' as defined in the Task 7 draft report) as very high-flexibility appliance to considered as priority, as this may create an unfair competitive advantage for products with integrated controllers. A lot of heating products are sold onto the market today with external controllers (e.g. heat pumps with zoned heating controls). The ability to provide external controllers can allow for more advanced system capabilities, upgradability and even more important, the possibility to delegate the control of the product to an external Energy Manager. The control of the product is indeed to be considered a logic function that could reside anywhere, even more when considering connected appliances, and as such there should be no differentiation if it is built internally to the device, if it is an external module or if it is Software resident on the web. The decision to exclude them from the scope or not to treat them as a priority product would eliminate a large proportion of flexible products from being able to apply the energy smart label or would create a paradox where an Energy Smart appliance would lose its 'Smartness' the moment in which is managed by an external energy manager. The heating and cooling market represent a very modular market where appliances consist of several separate components. A lot of these products are those with the most significant flexibility potential, and this decision would create confusion for consumers and un-fair competition in the market, and less flexibility for the gird. We therefore propose that combining a certain product with a suitable external controller can lead to a smart appliance, as well. Alternatively, it might be interesting to think in terms of system, without distinguishing the location of the controller.

Customers are more and more attracted by cloud-based control system as rightfully identified within the preparatory study. Besides the ease of use that this solution offers, it allows to decrease the costs that will to be bared ultimately by the end user of integrating additional memory of more advanced ships into the controller to cope with the required computational loads to optimize the equipment flexibility. Excluding the possibility that part of the flexibility functions maybe located outside the controller will drive up the price of the equipment for the end user and limit the potential for innovation in flexibility management.

We understand that the one of the challenges of including products with external controlers into the scope and as priorty products is compliance checks and market surveillances. As potential methods of implementation, we think it is possible to get inspiration from the regulation approach to space/ water heaters and multi-split systems (that are not sold as a single product but as a set or package). The manufacturer can declare the combination(s) that will form the final smart system (thermal appliance + controller). Market authorities select from these combinations for testing and the label only applies for the declared combination (compliance is also verified on the manufacturer catalogues and commercial documents). For the verification in case functionalities are on the cloud, we think it should be possible to set up the test using an emulator or a tester access to the cloud platform and to control the software version code key and date of issue.

1.9. Product Safety

APPLiA members take the safety of their appliances very seriously – consumer safety is non-negotiable. Therefore, the appliance should be able to overrule requirements coming from the grid, if these requirements may compromise the safety of the product, the safety of the content of the product, or if they would impact its performance. For example, if a refrigerator is turned off for too long, the food that is stored in the appliance may expire and provide health risks to the consumer. Also, if a washing machine is turned off for too long, the clothes that are inside may be damaged due to mould. Of course, these limitations are product-specific and need to be handled vertically, where appropriate experts can evaluate this.

1.10. Interoperability requirements

The market for Energy Smart Appliances is moving ahead quickly. New developments are popping up every day, and innovation is key for upholding a competitive European market. APPLiA therefore believes that the common data models and application protocols that are mentioned in the study as part of the requirements for interoperability, should allow for sufficient flexibility and speed – something that would not be achievable if they were specified in legislative measures. Due to the slower pace of the regulatory system, standards proposed in legislative measures simply cannot keep up with market developments.

Therefore, APPLiA suggests leaving the development of data models and protocols to the industry, or to standardisation activities that are sufficiently open to allow for constant changes and updates (an example of this is the work currently being done with SAREF or in CENELEC TC 59X) and are technology neutral. While we definitely support a standardised approach (so that technologies can be used by everyone), we also stress the need for flexibility. Also, multi-protocol or multi-signal solutions are already quite common and can allow different solutions to co-exist within the home. Another, preferred, solution could be to show information about the protocol that the Energy Smart Appliance is using – instead of defining the solution itself.

The term "application protocol" used in the study is not clear: what is meant by "application protocol" in the sense that it refers to any specific items that would need to be fixed? In general, APPLiA believes that (future) protocols should not be fixed: they should be open for everyone and open to new developments. Further clarification for the "application protocol" referred to in the study would therefore be necessary. An application protocol will fix technical specifications and, as such, it is necessary to coordinate this with the appropriate standardisation bodies to avoid lock-in of technology or hampering innovation. Interoperability should also consider the best possible use of technology. For example, it should not only consider the ON/OFF functionality, but also reduced capacity and proactive control based on tariff information from the network. Interoperability using a renewable, secondary power supply (such as PV or wind) should also be further considered. On the other hand, the fact that Energy Smart Appliances should support an upgradability functionality may be a complicated requirement, since it is not clear what is supposed to be upgraded.

Interoperability shall not be forced or mandated. It can be incentivised or promoted, guided or specified, but requirements should not be too complex. A minimum set of mandatory commands/messages in every appliance would be needed for building a minimum interoperable status throughout the market. Nevertheless, regulations should not prevent companies' willingness to introduce new solutions, regardless if proprietary or not, as long as the end consumer is clearly made aware of what he/she is getting. This could otherwise be a severe limitation to innovation and new business models, which of course could not be the objective of the EU.

To conclude, any single data model and application protocol should not be regulated and left to industry driven initiatives/standardisation bodies. Any standardisation process needs to be open, flexible and lightweight, allowing for innovative market developments and changes in technology.

2. Horizonatal requirements (7.14.2.1)

APPLiA has made an assessment of proposed horizontal and vertical requirements, including a suggestion and several alternative proposals.

(a) Possibility of disabling energy smart functionality
No further comments.

(b) The energy smart functionality shall be disabled by default
Yes, this requirement makes sense. Clarification of the terms "disabled", "enabled" and "first time enabling" would be welcomed, as those definitions can be understood in different manner depending on the energy smart functionality.

(c) Possibility to overrule external energy smart command

Yes, the user's option to override makes sense. For example, for appliances where the operation can be interrupted, this requirement has merit. If users want to override requests from the utility (or any other party), they should be able to do this. Of course, the details of the requirements are best fixed in the vertical lots where such product specific issues can be evaluated.

(d) Automatic resume of default operation

No further comments.

(e) Settlement support functionality

If we understand this requirement correctly, it recommends a settlement support functionality for the purpose of supporting direct Demand Response business cases with an external party. In addition, the appliance should keep measurements, and record its historical power consumption in memory. Optionally, it records the external instructions received. However, we believe that this does not make sense, as many appliances do not have the process power, nor the memory, to process and store this information. It would also require from manufacturers to include extremely precise measurement tools in their appliances, increasing costs for customers while not being always useful for the customers. Therefore, such a settlement function should not be a necessary part of the appliance. It could be, however, included in the energy management system, in the smart meter, or something that is assured from the energy provider. Usually, contracts with energy providers including demand response considerations do include the installation of third-party external equipment that would be able to deliver those type of information at the house level or for individual appliances.

(f) Any energy smart appliance shall make energy consumption data available to the user, via an open interface and the display (if available)

Appliances shouldn't have to embark on calibrated metering or to assure metering functions, especially with the recent deployment of smart meters in Europe. If the appliance is able to provide a power profile, then this power profile could also be provided to the consumer – this is feasible and could be beneficial to the consumer. However, this is done in advance. Otherwise, an appliance would need to store all its data in order to make it available to the user, and manufacturers would be forced to add cost to the products (which would ultimately come back to the consumer).

We therefore recommend making this requirement optional, and to re-formulate this requirement to fit it to the appliance's power profile, though we would refrain from adding any additional criteria for this: for many companies, the provision of the power profile is already a de facto option (e.g. air-conditioning). Moreover, we do not see any necessity in disaggregating the home's power consumption (with is already done by – for example – certain Smart Meters that allow consumers to make a distinction between certain types of products) on an individual appliance basis. In addition, providing data to the user may require products to have a display or an application to be able to show this data.

For the reasons above-mentioned, we recommend deleting this requirement (and sub-requirements on forecast, average etc) or rephrase it to leave the flexibility on how/which data are provided to customers: *Any energy smart appliance shall make energy consumption data available to the user.*

(g) The communication interface of energy smart appliances shall support the following horizontal requirements

i. Common data model: the (application protocol of the) communication interface of an energy smart appliance shall support the specific common data model;

We believe that this requirement – as it stands now – should not be included, as the market for energy smart appliances is moving ahead quickly. New developments are popping up every day, and innovation is key for upholding a competitive European market. We therefore believe that common data models and application protocols should allow for sufficient flexibility and speed – something that would not be achievable if they were specified in legislative measures. Due to the slower pace of the regulatory system, standards proposed in legislative measures simply cannot keep up with market developments.

Therefore, we suggest leaving the development of data models and protocols to the industry, or to standardisation activities that are sufficiently open to allow for constant changes and updates, such as SAREF, OCF implementations of data model definition and protocol implementation or work being done in CENELEC TC 59X and are technology neutral. While we definitely support a standardised approach (so that technologies can be used by everyone), we also stress the need for flexibility. Also, multi-protocol or multi-signal solutions are already quite common and can allow different solutions to co-exist within the home. Another, preferred, solution could be to show information about the protocol that the energy smart appliance is using – instead of defining the solution itself.

ii. Any energy smart appliance must comply with EU cyber security and data protection legislation

The home appliance industry is committed to making its products as secure as possible, and the protect the privacy of consumers to the highest level. Even though the idea behind the requirement is the right one, Ecodesign may not be the correct place to put it. Other legislative instruments are already available, or are being developed, that would be better suited to address cybersecurity and privacy, such as the General Data Protection Regulation (Regulation (EU) 2016/679), the proposed e-Privacy Regulation and the proposed Cybersecurity Act.

iii. Remote software update functionality

This requirement lacks specificity, because different products will behave in different ways, based on which manufacturers might also want to upgrade their appliances in different ways – that are most suited for the product at hand. It is also not practical, as manufacturers cannot design in support for future technologies that do not exist. We therefore recommend deleting this requirement.

Remote software update functionality could make sense when it comes to upgrading the smart functionalities (mostly software related) but not for all the product functionalities (with a direct connection with the hardware).

Moreover, this is a very competitive issue that should not be formalised in a regulatory requirement, since it will prevent companies from innovating. For example, it may be a feature of high-end devices, that cannot be forced onto the regular range – though every connected device will have some form of upgradability, there is no guarantee that it can support every future feature or interface demand. Therefore, we believe that this requirement should not belong to regulations under Ecodesign. Solutions may however be developed within standardisation, where there is close cooperation with industry and a close relationship to the available technologies.

iv. The appliance is able to communicate with a local controller or customer energy management system without making use of the internet

Appliances are able to receive signals from outside sources and can decide on what command to follow – this is an inherent part of the definition of a smart appliance.

However, these outside sources are not necessarily limited to energy management systems, if properly, wired or wireless, connected to a network infrastructure. Also, the consumer should have a choice here, to adapt the appliance to fit with his or her own architecture. Requiring an appliance to have the ability to communicate both externally and locally will require additional software/hardware in the controller without it being used systemically by the end user.

Therefore, we suggest rephrasing this requirement as follows: *Energy smart appliance should be able to communicate to a controller regardless if the controller is inside or outside of the customer home network.*

v. If the appliance connects to a manufacturers cloud/IoT platform, then the flexibility interface functionalities must also be available via web interfaces on that cloud/IoT platform

No further comments.

vi. The communication interface supports a direct flexibility interface

This requirement seems to be redundant, since it is inherent in the definition of smart appliance.

vii. The communication interface supports requests for the historic power consumption and external instructions received

APPLiA believes that this does not make sense, as many appliances do not have the process power, nor the memory, to process and store this information. Therefore, such a settlement function should not be a necessary part of the appliance. It could be, however, included in the energy management system, in the smart meter, or something that is assured from the energy provider.

3. Vertical requirements (7.14.2.2)

3.1. Periodical appliances

(a) A minimum amount of flexibility (The user must be able to select a deadline of up to at least 24h in the future from the moment of program configuration)

No further comments.

(b) Availability of flexibility quantification functionality;

The estimated energy consumption profile, a list of periods during which the appliance can be paused, and the scheduled user configurated start deadline of the program; When the appliance is active and executing a scheduled program, also: the current point of execution in the program and the current state

No further comments.

(c) Default configurable surplus energy consumption limit (Available setting that can be changed by the user via an open interface and display)

No further comments.

(d) An energy smart appliance must support a minimum instruction set

This requirement is already well-defined by the standardised use cases on Demand Response.

(e) Energy smart functionality is documented in the technical documentation and user manual of the appliance

Here, it needs to be clarified what the purpose is for explaining the energy smart functionality and for whom this explanation is intended. If the explanation is intended for the consumer, then it makes sense to place the information in the user manual. If, on the other hand, the explanation is intended for the Market Surveillance authorities, then the technical documentation would be sufficient.

(f) If no start command is sent to the energy smart periodic appliance, in case of communication failures, or if the commands sent to the appliance would result in trespassing the user deadline, the appliance starts the program automatically at the user configured program start deadline.

No further comments.

(g) Any energy smart appliance with indirect flexibility interface must, when possible, schedule an operation when the electricity price is at its lowest within the timeframe specified by the user

No further comments.

3.2. Thermal appliances

(a) The user can set the upper-and lower bounds of the acceptable temperature range

We believe that an appliance should have a minimum amount of flexibility, i.e. energy content that can be stored between upper and lower comfort limits. So far, the consultant, only recommends minimum amounts to be defined. We would recommend defining minimum and upper limits and to develop of scale of flexibility that would allow to classify/rank the flexibility of appliances and allow for comparison for consumers (via different levels of flexibility). This would allow consumers to compare between energy smart appliances. Otherwise, a customer might not be able to identify on the market between an appliance that it is only meeting the minimum flexibility amount and an appliance that would be more flexible. Our industry is ready to be part of the process in working with the commission in defining the different level of flexibility via the future working groups, as proposed in the report.

(b) The appliance communicates a power flexibility graph 7.10.6.4 (p80)

Currently, the recommended requirement relies on an accuracy of 5% with 15-minute step measurement. Having such precise graph would requirement very precise embarked measurement tools, that require important investments from manufacturers, costs being passed on to customers, customers would not see any pay-back on those embarked technologies. Even by decreasing the accuracy recommended, we believe that this requirement does not provide sufficient value to the customers and the grid to be maintained. APPLiA suggests to precise this requirement at product level.

(c) The appliance must support a minimum instruction set for thermal appliances 7.12.2.2 (p96)

No further comments.

(d) The appliance must respect the user comfort bounds at all times

No further comments.

(e) Any energy smart appliance with indirect flexibility interface must, when possible, schedule an operation when the electricity price is at its lowest within the timeframe specified by the user.

We believe that this requirement can be removed. Price variability may not be the only logic for an energy manager to take into account. There are different algorithms that take into account more than just price, such as comfort.

To facilitate the overview of the above comments concerning horizontal and vertical requirements, the below table provides a short summary:

Requirement	Consultant's proposal	APPLiA feedback
Section 2 (e)	*Settlement support functionality*	This requirement should not be included
Section 2 (f)	*Any energy smart appliance shall make energy consumption data available to the user, via an open interface and the display (if available)*	We recommend to make this requirement optional
Section 2 (g) i.	*Common data model: the (application protocol of the) communication interface of an energy smart appliance shall support the specific common data model;*	This should be covered by standardisation
Section 2 (g) ii.	*ii. Any energy smart appliance must comply with EU cyber security and data protection legislation*	This shall be covered by GDPR, e-Privacy and Cyber Security Act
Section 2 (g) iii.	*Remote software update functionality*	Standardisation should specify the level of upgradability

Section 2 (g) iv.	*The appliance is able to communicate with a local controller or customer energy management system without making use of the internet*	Alternative proposal: "Energy smart appliance should be able to communicate to a controller regardless if the controller is inside or outside of the customer home network"
Section 2 (g) vi.	*The communication interface supports a direct flexibility interface*	This requirement seems to be redundant, since it is inherent in the definition of smart appliance.
Section 2 (g) vi.	*The communication interface supports requests for the historic power consumption and external instructions received*	We don't support this requirement as this should not necessarily be part of the appliance.
Section 3.1 (e)	*Energy smart functionality is documented in the technical documentation and user manual of the appliance*	This requirement lack further clarification.
Section 3.2 (b)	*The user can set the upper-and lower bounds of the acceptable temperature range*	We would recommend to define minimum and upper limits. If a ranking is proposed, it has to remain simple.
Section 3.2 (b)	*The appliance communicates a power flexibility graph 7.10.6.4*	This requirement (including the accuracy) should be further precised at a product level.
Section 3.2 (e)	*Any energy smart appliance with indirect flexibility interface must, when possible, schedule an operation when the electricity price is at its lowest within the timeframe specified by the user.*	We recommend to remove this requirement.

For a detailed explanation, please, refer to the relevant part of our Position Paper.

4. On the proposed roadmap

APPLiA reads with interest the proposal to work on further definition of vertical requirements in dedicated product groups involving stakeholders and experts. APPLiA is fully available to closely work with the Commission and the study team and stakeholders in order to best define these requirements.