APPLiA represents the home appliance sector in Europe. In general, our sector is a promoter of energy smart appliances and Demand Response technologies in Europe. In addition, our sector has historically supported Ecodesign regulations and their results. We are interested to pursue solutions that are meaningful for all stakeholders, consumers first. Therefore, we welcome the opportunity to provide our suggestions for possible requirements under Task 7 of the preparatory study on Ecodesign for smart appliances. Please find below several key remarks and suggestions.

### Definitions

We believe it is crucial to apply one, single definition of energy smart appliance throughout the European Commission’s various legislative activities. In addition, 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 and 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.

### Use Cases & Standards

As an industry, we have defined the relevant use cases for Demand Response capable products, and those use cases have been standardised by CEN/CENELEC and ETSI, within the broader list of Smart Grid use cases (i.e. emergency signal for critical peak – grid black out risk, load shifting to reduce consumption at peak time and smart start to use lower tariff or green energy). We strongly suggest that the study – and more importantly – the regulatory process considers these cases when defining the required product functionalities.

In addition, we take this opportunity to point you towards draft standard EN 60335-1 (Household and similar appliances, General Requirements – safety - including appliances which may be controlled through or communicate with public networks) (61/5581/CD) and EN 60335-2-30 (Household and similar electrical appliances – Safety- Part 2-30: Particular requirements for room heaters). Notably, there is a section in EN 60335-2-30, proposing that a marking be placed on heaters with remote operation function, with an explanation in the user manual to indicate that the heater can be started at any moment, and it should not be covered by or in the vicinity of flammable materials.

The marking that is proposed looks similar to the marking that is shown in the draft Task 7 report of the Lot 33 preparatory study. Please make sure that this does not lead to confusion, unnecessary diverging or contradicting requirements, or multiple, similar, labels for consumers on different product categories.

### Recommendations on Requirements

Looking at the requirements that were proposed in the latest draft of the Task 7, we have made an assessment of each requirement and made a suggestion for how to proceed. In addition, we have proposed several alternative requirements to be included.

The user should have the possibility to enable/disable the Energy Smart functionality in the user settings

Yes, this requirement makes sense.

The Energy Smart functionality is disabled by default

Yes, this requirement makes sense.

The user always has the possibility to overrule an 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.

A smart appliance should fall back to standalone operation when the Energy Smart functionality fails

Yes, this requirement makes sense.

A smart appliance should have a minimum amount of flexibility:

* Periodical appliances: the user must be able to select a deadline of up to at least 24h in the future from the moment of program configuration

In general, we support this point. However, the term “minimum amount of flexibility” is misleading. However, going into specific values would be quite difficult, due to the different products, etc. The time indication for 24h is not necessary at this time.

* Thermal appliances (2a): the energy content which can be stored between the upper and lower comfort limit

We appreciate the intention of this requirement, to allow the user to be able to set the min. and max. temperature levels in order to be comfortable. However, the max. and min. temperature levels depend on the product, and often also how the product is connected to the building in which it is placed (part of the flexibility that an appliance can offer, may also come from the building). This is something that cannot be known before the product is actually placed in the building. We therefore suggest that this should be fixed in product-specific, vertical legislation. Moreover, for thermal appliances, a certain level of flexibility in comfort would be needed to make use of the external (building installation) flexibility. Therefore, this requirement would need to be clarified. However, going into specific values would be quite difficult, due to the different products, etc. and we question whether these functionalities are even possible within the scope of the study, as it stands now. For example: the external control products (see below), which we consider to be a fundamental issue for the scope of the study. Moreover, a product is defined by a manufacturer, and could be made from different components.

A feasible approach could be to adapt the given upper and lower limits to the respective building and to the specific requests of a certain customer in regard to his or her comfort. A customer who is very sensitive to temperature changes could choose a smaller temperature window whereas a customer who is more robust could change a larger one. On the other hand, the appliance should also be flexible towards the grid. For this, there can be different levels of smartness (depending on what the product can deliver to the grid). It would be good to have a quantification of those levels of smartness.

* Thermal appliances (2b): define a reference setup and a measurement procedure to see how much energy can be stored between the lower and upper limits.

Firstly, we propose to replace the reference to the lower and upper limits with the level of energy flexibility.

Secondly, like for thermal appliances (2a), a certain level of flexibility would also be needed to make the appliance energy smart in the case of thermal appliances without thermal storage (2b). The appliance should also be flexible towards the grid. For this, there can different levels of smartness (depending on what the product can deliver to the grid). It would be good to have a quantification of those levels of smartness.

For sure, this requirement is very product-specific, and would require a vertical approach.

A smart appliance should have flexibility quantification functionality

I.e. to know in advance the estimated power profile for a cycle or setting (see the use cases mentioned earlier), so that an energy manager can use the input for its own analysis. This requirement would make sense, but it needs to be clarified/re-written.

In the report, the following four options are mentioned:

* Horizontal option 1: Real time power flexibility, with actual power status;
* Horizontal option 2: Estimated power flexibility for the near future and actual status;
* Vertical option for periodical appliances: The appliance communicates an estimated energy - consumption profile;
* Vertical option for thermal appliances: The appliance communicates a power flexibility graph.

For the thermal appliances, the last proposition would be preferred, according to the report. However, this would also be the more complex solution. We believe that this solution would be difficult to achieve because the power flexibility graph depends on building inertia, hot water profile consumption, etc.

Based on the above, we would definitely suggest that the details of such requirements are dealt with based in a product-specific, vertical approach.

A smart appliance should have a 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. 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.

Moreover, a smart appliance is an appliance that is in line with the definition that is mentioned in the beginning of this document, as well as with the three existing minimum Demand Response use cases. As we already mentioned above, these use cases have already been standardised and are strongly supported by the industry. Therefore, it is the definition and those use cases that should be mentioned instead of this requirement.

A smart appliance should make energy consumption data available to the user

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 to make this requirement optional, and to re-formulated 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 don’t 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. However, this is not what makes an appliance smart and it should not be a requirement for an appliance to be seen as smart.

A smart appliance should have a maximum surplus energy consumption

This is already provided/defined in European Commission Regulation (EC) 1275/2008 and in European Commission Regulation (EU) 801/2013 (Ecodesign requirements for standby, off mode electric power consumption of electrical and electronic household and office equipment), as these regulations refer to the maximum energy consumption of an appliance in standby or network standby, when waiting to receive a command. Therefore, we suggest to remove this requirement. However, please know that certain smart appliances are often or always in an operation mode. This is at least the case for thermal appliances (2a) and (2b), because these appliances are normally in continuous operation.

In case we speak about a surplus of energy stored in the appliance (for example, in a smart Domestic Hot Water product, it is possible to store more energy than the user needs), the surplus stored energy will simply be used the day after. However, to store more energy, the appliance has to store the water at a higher temperature. The temperature gradient between water and ambient being higher, the heating loss will be more significant than in a standard situation.

The communication interface should have “resource discovery” functionality

Yes, this requirement makes sense. However, we question whether it should be in the communication interface. We agree that the product, in the broader sense, should have the resource discovery functionality, though we do not believe that this should necessarily be limited to the interface. We believe that the manufacturer should be able to decide where to designate this capability. In addition, it should be customer’s choice to decide for a standalone application or to extend the functionalities to resource discovery, as covered under the first requirement: “the user should have the possibility to enable/disable the Energy Smart functionality in the user settings”.

The communication interface should support a common data model and application protocol

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.

In all, we suggest making the requirement more generic, as the general idea behind the requirement (on sharing a common language) is quite good, but it should refrain from mentioning protocols or communication interfaces.

The communication interface should support cybersecurity and privacy requirements for connected devices

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 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.

The communication interface should support an upgradability 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.

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.

The communication interface should support communication with local and external energy management systems

We believe that the principles that are behind this requirement are the right ones: 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 to make this requirement more generic, so that it will fit better with the situation as it is in practice, for example: “the communication interface should support communication with local (in the home area network)/external (for example: cloud-based) systems, with the aim to influence the energy consumption of the smart appliance.”

A smart appliance should have a direct flexibility interface

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

The direct flexibility interface should support a minimum instruction set

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

In case the smart appliance supports an indirect flexibility interface, it should comply with min. interoperability requirements

We believe that this requirement is redundant, because of the points that we already made above regarding protocols, and because – in the end – it is the utility who decides on the standard format for the price messages.

In case the smart appliance supports an indirect flexibility interface, the appliance should make optimal use of price variability

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.

The Energy Smart functionality should be explained in the technical documentation and/or 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.

Product safety – NEW

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 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.

Reference to standards – NEW

We would suggest to make a reference to the standards, for example by stating that the two-way communication that defines a smart appliance should be based on existing standards, though we would leave the specification of those standards open. One example of this suggestion would be the Smart Premises Interoperable Neutral-message Exchange (SPINE) that has been standardised within CEN/CENELEC (i.e. EN 50631-1 Household Appliances Network and Grid Connectivity – Part 1: General Requirements, Generic Data Modelling and Neutral Messages). This standard defines data models for Interoperable Connected Household Appliances. The data model is derived from a logical decomposition of use cases into functional blocks that themselves are realised by abstract actions on the data model itself.

### External Controllers

Regarding the thermal appliances group, we are concerned about the consultant’s initial suggestion to exclude appliances with external controllers (‘controller’ as defined in the Task 7 draft report), 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, and the decision to exclude from the scope would eliminate a large proportion of flexible products from being able to apply the energy smart label. The heating and cooling market is a very modular market where appliances consist of several separate components. In our view, 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. We therefore propose that combining a certain product with a suitable external controller might 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.

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| APPLiA - Home Appliance Europe represents home appliance manufacturers from across Europe. By promoting innovative, sustainable policies and solutions for EU homes, APPLiA has helped build the sector into an economic powerhouse, with an annual turnover of EUR 44 billion, investing over EUR 1.4 billion in R&D activities and creating nearly 1 million jobs. |  |