

VITO
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Belgium
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Dear Sarah Bogaert

BEAMA is the trade association for the UK Electro-technical industry, representing over 200 companies in the power, electrical and building services sectors. Our members, who range from multinationals to SMEs, manufacture the wide range of equipment required for end-to-end electrical systems.

BEAMA therefore represents a wide range of manufacturers in the connected homes and smart controls sector. This includes, but is not limited to, consumer access devices, heating controls and electric heat and hot water systems, heat pumps, ventilation equipment, and the multitude of smart devices, control systems and communication platforms designed for connected homes and buildings.

BEAMA has taken a strong interest in this preparatory study as it opens up new questions with regard to energy efficiency, smart control and system design. BEAMA has responded to previous consultations and call for evidence under this study and below we summarise our overall position on smart appliances which we maintain with further supporting evidence and specific comments on the recently published Task 5 and 6 reports.

We have expressed our initial views on the policy objectives and options to be published in the Task 7 report.

Summary

BEAMA support the overall drive to develop a European market for smart appliances and agree with the outputs of the Task 5 and 6 reports, which outline the general system benefits of DSF. The support from the commission and member state governments to develop a framework for this market is commended. However, BEAMA still question the suitability of eco design for the type of options now being considered and have concerns over the analysis that has already been undertaken, these concerns are summarised below

- The study still lacks detailed consideration of the type of smart functionality appliances would adopt to enable DSF. This should be undertaken with member state smart meter rollouts in consideration and the functionality each rollout supports.
- The modelling work should consider scenarios for smart appliance uptake based on low, medium and high scenarios of uptake.
- Detail needs to be included on the importance of self-consumption of onsite generation. It is currently not clear how this is being considered and BEAMA believe there to be considerable benefits from this.

- The heat and hot water sector should be targeted as a key means for demand side flexibility – this is where BEAMA members see the most potential in the UK and EU, which is already highlighted in various EU position papers, including the heating and cooling strategy.
- Any requirements set out in potential policy options need to be reviewed for each product category.
- The modelling so far lacks information on the industry cost benefit analysis. This can only be achieved once a more detailed review of the options and ‘smart’ functions has been made for each product category.
- The consultation period and timescales for the study and remaining work is insufficient to allow for member state input and the careful consideration of policy options.
- Any policy options should not see the banning of non-DSF ready products. This would be viewed as over-regulating the market.

Interoperability and mandatory principles should be determined through the standardisation process led by industry. It is not acceptable to decide on a horizontal mandatory principle for the market. Analysis should continue for each product category, identifying those products with the most potential for DSF and lowest cost impact to industry and the consumer. Until a detailed review of product categories is made the CBA for smart appliances and associated functions cannot be made, and industry will not support any regulation.

Industry would favor a labeling scheme that incentivises the market to adopt DSF capable systems, and this should be aligned with other regulatory activities, specifically the revision of the Energy Performance in Buildings Directive.

Industry would not support ‘specific requirements’ as a mandate under eco design. It is more favorable to consider ‘essential requirements’ that set a principle for the market, e.g. any communications enabled appliance must be interoperable (See Annex 2). Furthermore non- DSF capable systems are allowed to exist on the market – assuming that the incentives in place for consumers and industry are enough to drive market uptake of DSF appliances.

In summary developing the market for smart appliances should be done through:

1. The provision of appropriate information to consumers
2. Incentives for manufacturers to develop DSF capability
3. A market design that provides the business case and value for consumers to adopt DSF capable appliances which will ultimately drive market uptake.

It is very difficult to speculate at this early stage in the market on what options would be most suitable for an eco-design measure for smart appliances, especially with the current gaps identified in this analysis. BEAMA are therefore concerned about the current timescales for this work given the detail that is lacking. We strongly urge the Commission and consultants overseeing the preparatory study to consider an additional consultation before the task 7 report is published. The options presented in the task 7 presentations at the stakeholder meeting do not provide enough clarity, and it is still very unclear exactly what requirements, and potential risks this would place on the range of product sectors affected by this study. It is not acceptable to expect industry to respond only when these options are decided and a draft regulation is on the table.

Task 7 - policy options and recommendations

1. **Any measure should NOT specify the communications standard -**
BEAMA maintain the position that it is too early to set regulatory measures for the smart appliances sector, for a number of reasons; Firstly, the market drivers for Demand Side Flexibility and Demand Response are still not clear. How this market develops and the type of services suppliers and DSOs deliver will also influence the requirements for smart appliances. Secondly, we support the need to maintain open standards in the market, in order to ensure we do not close doors to communication systems that would be fit for purpose in a market for highly sophisticated system application in the home. More explanation is provided in Annex 1 to explain why we should not be picking one standard for the market today and future requirements for low powered meshed communication protocols.
2. **Interoperability and any mandatory principle should be determined through the standardization process**
3. **Industry should be incentivised through 'smart readiness indicators' -**
Precedents have already been set for other products under Eco design , including ventilation equipment, which could help in designing something more suitable for smart appliances. In this case products have been set labelling requirements only, without any specific eco-design measure, and therefore products are not banned from the market. BEAMA members are more supportive of a voluntary scheme of this type and the development of a specific indicator on energy labels to determine whether a product is DSF capable. This is provided the definition of 'smart' functionalities is appropriately worked through in the standardisation process and with adequate consultation. This would incentivise manufacturers to put such products on the market, while giving consumers information to help their purchasing decisions and allow them the choice.
This approach is consistent with the current intentions in the revised Energy Performance in Buildings Directive to include 'smart readiness indicators' on Energy Performance Certificates for Buildings. This describes the performance of the building itself, and therefore raises another level of complexity that must be considered with any final analysis of policy options. That is the relationship with the built in capabilities of a building Vs the products and controls that may provide some of the future DSF capability.
4. **Any principle adopted for DSF ready appliances should not affect the energy efficiency rating of an appliance -** this has been suggested as one of the options for Task 7. This would be seen as too complex due to the difference in energy efficiency and reduction, to demand flexibility.
5. **The domestic demand side flexibility market should be incentivized through appropriate market design, not product regulation -** While we don't have a market design to support domestic DSF, there is not yet a business case for aggregators, consumers and utilities to enter into the domestic demand side market. The focus of the commission should first be on setting the requirements for market design to incentivise an effective

balancing market, and not use product regulation as a means to mandate demand side flexibility for consumers.

6. **Any measure should not see the banning of non-DSF ready appliances**
- BEAMA would not support options that ban products from the market as this would be viewed as over regulation. As previously discussed we would support any measure that will incentivise manufactures to put smart devices and appliances onto the market. Setting the principles for this would be possible and the necessities for interoperability to be met through the standardisation process. We therefore support a lighter touch regulation that provides the basis for market incentives and the principles for DSF and interoperability. This is especially important given the different applications allowable through smart meter programs across Europe. The UK have selected a program that will support a domestic DSF market. This will ensure 3 available options for DSF¹²:
 - Communication via the Consumer Access Device (CAD) – allowing for the communication of a price signal to a control/ appliance
 - Auxiliary load switch – direct load control
 - Peer to peer communications (see Annex 1)
7. **Detailed product specific analysis is required to determine the appropriate measures** – the current study lacks detailed analysis of products and the type of control/ functions they would require to become DSF ready and interoperable. A horizontal look at options for the market is not appropriate. Product categories should be analysed based on their DSF capability and the CBA for industry and the consumer. Only then will Industry be able to confidently review the options.

Furthermore, BEAMA members currently conform to existing regulatory requirements under Eco Design which would directly conflict with DSF enabling applications if mandated through this Lot. A good example of this would be the requirements under Lot2 for water heaters which sets out minimum functionality for smart control. In this instance smart control determines a usage profile for the consumer and uses this to optimize the efficiency of the system. This relies on regular patterns of usage (indicative of domestic water usage). If you then apply DSF and the option to interrupt usage patterns this may affect the efficiency of the system and changes will need to be made to the overall smart control applied with water heating. BEAMA support the fact that water heating could provide an effective means of DSF, however, in considering how the industry would be incentivized to provide suitable products onto the market, a mandatory requirements under Eco Design could be costly. This therefore justifies a detailed review of smart controls as applied for water heating and a blanket requirement for DSF and all appliances may not work in the market.

¹ BEAMA Consumer Access Device Guide
<http://www.beama.org.uk/resourceLibrary/consumer-access-devices-a-beama-guide.html>

² Beyond Smart Metering <http://www.beama.org.uk/resourceLibrary/the-beama-connected-homes-demonstration---beyond-smart-metering.html>

Industry risks and considerations

BEAMA have noted that the current modelling work lacks detail on the industry cost benefit analysis. This is challenging to evaluate as it will be different for product categories and the functions to be determined within a mandatory or voluntary measure. However, this is vitally important and BEAMA ask the commission to carefully consider any options in light of costs and benefits to the market for smart appliances and associated devices.

We have already highlighted the risks associated with conflict across other Eco Design lots. Again this will be drawn out from a more detailed technical analysis of the type of measures required for DSF.

Product categories- potential for UK DSF

EV Charging

BEAMA support the move now taken to include reference to EV charging infrastructure in the scope of this preparatory study. This is an important target for demand side flexibility and should not be ignored. The UK Department of Energy and Climate Change have worked with ICF to develop a better understanding of this potential and BEAMA fully support the use of this work.

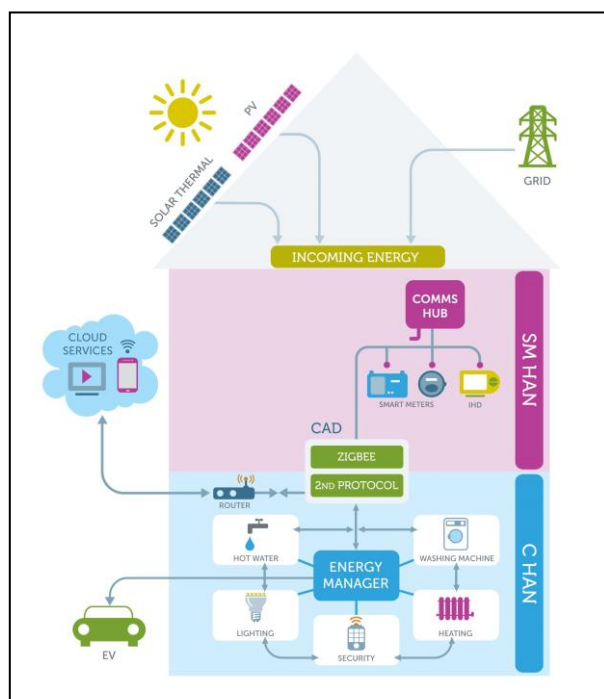
Storage for space heating

There are a range of new thermal storage heaters now on the market. These have also be trailed in the UK for the specific purpose of DSF and providing peak load avoidance³. Trials have shown thermal storage heaters to be an effective form of DSF. Systems now have considerably enhanced storage systems and heat retention capabilities with the DSF market in mind. There is limited reference to these applications in the preparatory study so far (Task 6 page 19 table 10). This is another example of where a more detailed review of specific product categories is needed if we are to make a judgment on what the most suitable measure would be under eco design for smart appliances.

As of 2011, 7.8% of the domestic housing stock in the UK uses electric storage heating (source Oftec/DCLG 2011) and we estimate that this would equate to a ca 16GW of installed storage heating (just domestic).

³ <https://www.ssepd.co.uk/NINES/>

Onsite generation and the role of the home energy manager



Within the Consumer Home Area Network smart appliances, onsite generation, heating, hot water and EV charging systems can be integrated and automated via the Energy Manager. In this instance the energy manager balances the on-site generation available (stored or real time generation), with various appliances requiring energy and the homes overall demand on the grid. In this instance appliances are only required to communicate with the C HAN and energy manager, rather than contain the smart characteristics within the appliances to undertake all of this intelligent decision making. BEAMA have published a series of papers which explain the process of decision making

undertaken by the energy manager, and the integration of data sources from onsite generation, the grid and within the home⁴. We recommend these scenarios are considered in the study.

Thank you for your time in reading through this paper. BEAMA are keen to arrange a meeting with VITO prior to the September deadline to discuss the policy options presented in this paper. We look forward to hearing from you and welcome any feedback on the suggestions made.

Yours sincerely

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⁴ BEAMA Consumer Access Device Guide

<http://www.beama.org.uk/resourceLibrary/consumer-access-devices-a-beama-guide.html>

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ANNEX 1

Network devices and communications - further information to support the study

The future connected home will rely on the need for local intelligence, this could be between appliances and the home energy manager, or peer to peer communication. i.e. communication across and between multiple devices, (e.g. your kettle might send a signal to your freezer to switch the compressor off for 2 minutes, or your thermostat can talk to the smoke detector without going through the router). WiFi enabled devices generally exchange data through a remote service, i.e. they talk to a server and then data is passed back to another device, a far less efficient method of communication for local intelligence in a home energy system. Furthermore if the internet in this scenario is down, there can be no local intelligence.

The requirement for low powered, local intelligent communication has driven the emergence of mesh communication solutions (e.g. ZigBee, Z Wave etc). In the absence of mains power, a sensor or actuator could operate on battery supply for 2 to 3 years, typically on 2 AA batteries. These wireless standards are based on meshed radio technology and this allows messages to be repeated/ passed between devices (peer to peer) to ensure the message reaches its intended recipient, making communications less subject to failure.

There are also cost advantages to these mesh radio, lower powered, communication protocols, as the requirements of some simpler products, can typically be met using less expensive microprocessor and memory solutions. Moreover the customer's applications, heating etc, will continue to work even if communication is lost with the router.

To optimise the potential for energy efficiency and load shifting, devices need to know that the kW instantaneous power is increasing, and that other devices are activating e.g. in the previous example of the kettle and refrigerator. Similarly devices installed for other applications may share relevant data, e.g sensors as part of a home security system can tell the heating to turn down or up, and depending on whether the doors, or windows are open for a period of time to ensure energy is saved.

The reason we are advocating open standards at this time in the market is because any other approach would limit growth in this highly innovative sector. Industry are principally concerned that this would close doors, and therefore future options for consumers. You can already see moves in industry to work towards more integrated solutions and it is important to let the market decide. Out of the current standards already on the market there are pros and cons for all, depending on their application, so arguably we may not have found the right single wireless solution yet.

Today manufacturers are future proofing so the market is, in some cases, shouldering some marginal extra cost to ensure devices can communicate with the different meshed protocols. The market won't want to do this forever and so you can expect some convergence, but this should not be mandated. In future proofing



we are also ensuring the longevity of the devices being sold today and making the downstream devices (sensors and actuators) lower cost for consumers.

ANNEX 2

Terms and Definitions - as understood by BEAMA

Specific requirement - e.g. Wifi/ ZigBee / etc enabled - therefore setting a specific standard for the market

Essential requirement- e.g. appliances must be communications enabled - therefore setting a principle for the market to follow, the specific requirements of which to be outlined through the standardization process