Building Automation and Control Systems (BACS)

Comments on the final preparatory study on Ecodesign requirements

13th December 2021

ECOS, the EEB and the Coolproducts campaign welcome the preparatory study on Building Automation and Control Systems (BACS) that was presented at the Ecodesign and Energy Labelling Consultation Forum on November 15th 2021. While we acknowledge the complexity to regulate this product group that is composed of multiple components, we believe Ecodesign requirements could ensure a longer lifetime and thereby reduce electronic waste. By setting requirements on open documentation and spare part availability skilled repairers can replace parts that failed so that the other components continue to function.

Repairability

As pointed out by the study "greater use of modular design, provision of spare parts and provision of information on repair would increase the service life of BACS and lower their materials footprint". BACS can and should last longer than the projected 15 years. This may not be the case for each component of the system – but these should be easily replaced so that the rest of the equipment can last much longer. The following considerations are essential to improve repairability:

- We support the adoption of a requirement on the availability of spare parts in line with recently adopted Ecodesign measures for other product groups. The proposed 5 years for BEMS products and software and 8 years for other products are insufficient considering that BACS average lifetime can exceed 25 years. Therefore, we recommend BACS **spare parts to be made available for at least 25 years** after the last unit of the model is placed on the market.
- A requirement should be set for manufacturers to declare a mean time to failure (MTTF) for all BAC products. Product advertisements very often overstate MTTF as a sales argument. Therefore, any claim on **MTTF should be backed-up with 100% warranty** for this period.
- Instead of relying on certified repairers only we support the studies proposal to **make the list of spare parts publicly available,** as well as the **procedure for ordering them** along with the **repair and maintenance instructions**.
- In order to enhance repairability even further we would propose to **prohibit the removal of part number markings on chip surfaces** as it makes it harder to find replacement chips.

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- The study states that **minimum functionality regarding the upgradability of BEMS** could be implemented through a requirement on the upgradability of the memory. We regret that this option is not explored in detail so that a requirement could be proposed. It should for example be specified what type of memory, such as RAM, Flash or HDD should be upgraded to prolong BACS life (for details see list of spare parts below).
- We **support a list of spare parts** as provided in section 7.1.5.2.4. However,
    - "Memory for EMS software and data logging" should be **defined more precisely**. SRAM or eMMC for embedded CPUs (SoCs) are technically also "memory" but typically cannot and do not need to be replaced. Memory that is subject to continuous change (e.g. due to data logging) on the other hand, such as QLC NAND Flash can and will often fail due to exceeding the durability limitations and should be included in the definition.
    - The role of **capacitors**, which often cause the premature end of life for a product, should be evaluated in more detail.
    - **essential software such as security and firmware updates should be included** in the list of spare parts since embedded firmware is often hard to separate from a physical component.
- The study proposes to use an escrow service provider to ensure the availability of copies of product hardware embedded software and source code documentation in case the manufacturer goes out of business and fails to fulfil previous lifetime and repair requirements. We propose as a second option the **possibility to publish this information in a publicly accessible repository** under a suitable license (e.g. Open Source Initiative approved software license or CERN Open Hardware license) and make customers aware of the repositories and related licenses.
- While the study has not addressed the disassembly of BAC components we believe **minimum requirements are essential to ensure they are easy to disassemble** from the rest of the building to enhance repair and optimise the end of life stage.

Improve interoperability by requiring open access documentation

As rightly pointed out in section 7.1.5.2.5 interoperability is key to extend product lifetime by enabling upgrades and repair, while reducing the need for additional gateways and thus increasing internal power consumption.

We are in favour of the proposed interoperability requirements to at least **support an open documentation of the protocol** used between controllers and impose additional requirements on products relying on cloud services. However, to ensure that the protocol be genuinely open we are in favour of a precise definition of what “open” means.

When proprietary solutions are provided along with the sale of the product, an open protocol should be supported as well so that consumers always have a fall-back option to integrate their system with other technologies or devices, even when their initial provider goes out of business. For packaged products, proprietary solutions must be publicly disclosed and if possible, a reference should be made to an existing standard protocol.

Smart grid readiness

To improve the capability of buildings to integrate more renewable energy into the grid we would like to point to the **EN 50491-12 or Customer Energy Management (CEM) standard**. The standard defines how to manage the flexibility of devices and appliances within buildings, taking into account the signals received from the power system, user preferences and internal flexibility. By means of an interface, consumers can indicate their needs, be it for heating or EV charging. The CEM coordinates the energy demand and supply within a building in the most energy efficient way, ensuring that energy is used at the most optimal moment, for instance when the general energy demand is lower or when renewables are available and energy is cheaper.

We propose to add a ninth bullet point to the scoring system proposed in section 7.1.5.2.4: "9. Listing of supported EN 50491-12 (CEM) control types and demonstration of their interoperable behaviour.".

When setting minimum functionality requirements for packaged products as proposed in section 7.1.5.2.2 it is key to include elements that can enable demand response.

Minimum performance limits for internal power consumption

The study points out that performance limits on internal power consumption of BACS products cannot be set due to insufficient public data on power consumption and its link to the product's functionality. While we agree that setting limits could in this case have a negative effect on functionality, we support setting information requirements as a first step to assess power consumption, as proposed in section 7.1.5.3.3. On this basis minimum performance limits could be set at a later stage.

Recyclability

- To improve recyclability of components of BACS **the use of plastics should be restricted** since recycling operations of plastics such as PVC (Polyvinyl chloride) are currently not mainstreamed nor will they be cost-effective anytime soon because of their heavy content in (REACH) regulated substances. When it is impossible to replace plastic, alternative polymers that require fewer chemical additives in their formulation such as PP and HDPE, or a blending that can be immediately recycled should be used. Measures should be included to target the use of plastic for health and safety as well as recyclability considerations with regards to chemical content to identify potential material and substance alternatives
- In a circular economy, all products should include a **minimum amount of recycled content** to maintain material value as long as possible within the economy and avoid the use of virgin natural resources. Recycled content in products can indeed help reduce pressure on natural resources, support the market for secondary raw materials and preserve embedded energy as part of circular value chains. Therefore, a mandatory minimum recycled content for plastic parts should be systematically introduced into Ecodesign regulations and similar product legislation. A first tier should be set obliging to provide information on recycled contents. Then a second tier could consider quantitative targets.
- Due to the growing shortage **critical raw materials should be recovered** from components that are not covered by the WEEE recycling objective, such as copper, electrical connections (including lead soldering) and polymers. For all critical raw materials requirements should

be set specifying the type and location to facilitate their recovery. BAC parts containing critical raw materials should be easily dismantable.

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