

ENERGY STAR Storage Specification Draft 1 Comments from the European Commission

We provide in the following comments from the European Commission to draft 1 of the Eligibility Criteria of the specification. We generally appreciate and support the contents of the document.

Line 173 – Definition of SKU: As all other abbreviations in the text, SKU should be explained in the definitions.

Line 187 and 190 – Definitions of “Storage Element” and “Storage Device”: The wording used for the definitions of “storage element” and “storage device” is not clear and does not give unambiguous differentiation of the two categories. We recommend to revise the text.

Line 179–186 – Broad Definitions: We agree on broad definitions. If focus is put on speed, capacity, reliability and energy consumption, the actual technology and solution for achieving this is of less importance. E.g. if the same speed, capacity and reliability is obtained by redundancy vs. intelligent extra data processing, it could easily result in different energy consumption results depending on the chosen basic storage technology (or mix), also changing over time depending on the actual development stage.

Line 195–201 – Aggregating and Non-Aggregating Products: We agree on the necessity of differentiation between “aggregating” and “non-aggregating”. Aggregating may be considered part of the server job, which is not up for evaluation and comparison here. The degree of aggregating will though be very difficult to classify.

Line 216 – Note on Data Storage Efficiency: Software features like data deduplication, data compression and thin provisioning are mentioned as important contributors to improve energy efficiency. It is indicated that SNIA intends to include such software features into a single data storage metric. We also believe that such management features are essential for improving energy efficiency. However, we believe that it will be a complex task to develop a single data storage efficiency metric. The appropriate short term approach to support these features probably may be to request them as mandatory for Energy Star data storage equipment.

Line 225–250 –Taxonomy: We suggest trying to define the taxonomy more precisely. E.g.: How large is “a portion” (240), and how long is “moderate” and “long term” data storage (246, 250).

Line 236 and 243 – Storage Technologies: As a general remark, we suggest to be careful in mentioning of specific storage technologies (HDD, SSD, optical...), because it is not necessary and may complicate the main purpose of promoting the most energy/speed/capacity effective storage method. Over time, the various methods will alternately take the lead. Too much focus on technology will also complicate classification of hybrid methods.

Line 314 – Active State: It is expected that the terminology used for the different Energy Star specifications for servers, computers and data storage equipment shall be consistent using comparable definitions as far as possible. This means that comparable types of operation modes should be classified in the same way to avoid misunderstandings. We therefore support to use the proposed definition, which includes real active processes resulting from external I/O requests and not including maintenance, which is included in idle state. The SNIA

definition of the “active mode” would be not helpful in this context since it describes a state of high availability (could also be idle operation) rather than an “active mode” similar as it is defined for servers or PCs.

Line 320 – Idle State: We support to define an idle state, which is a traditional idle state, where the hardware is operating at no load and with no specific power management activated. Thus in idle, products are ready to maintain the service level implied by its taxonomy rating. For the idle mode it should be specified that all storage elements are running idle, none is in a low power or active mode.

Deep idle seems to be a confusing term and not very commonly used in scientific literature. We recommend to avoid it and to replace it by more standard terminology also used for other types of IT equipment (e.g. low-power, sleep etc.).

Different operation modes can occur for different storage elements and devices within one storage product (part of the elements in active, idle or low power mode). This situation seems not well reflected by the current operational state definitions.

There is a note on a proposal by stakeholders to introduce “hardware idle” into the definitions. It is not clear what the term “hardware idle” should describe in relation to the other definitions. However, it may be useful for the potential customers to be informed of power in several low power modes as part of the standard information reporting requirements.

Line 338–347 – Integrated Power Supplies: We agree that it is important that integrated power supplies are covered as well as long as it is possible to measure them.

Line 370 – Definition of Product Families: It is expected that the concept of product families will also be beneficial for data storage equipment. The approach for the definitions of maximum, minimum etc. configurations is different from the concept proposed for servers. While the definitions here refer to maximum and minimum power consumption, definitions in the server specifications refer to maximum and minimum active mode efficiency. We assume that the approach should be the same for both product groups. Thus it seems that the wording in the requirements for servers need adjustments.

Line 449–463 – Hybrid Systems: We appreciate the intend to include hybrid storage systems partly because the categories should preferable not be defined according to technologies but functionality – partly because the development is fast and new storage systems based on different storage technologies may emerge on the market.

Line 437 – Included Products: In comparison to the Energy Star requirements for servers (where the scope is limited to the dominant market segment of volume servers up to 4 CPUs), it seems that the current draft for storage equipment does not consider any upper limits regarding complexity and performance for storage products to be covered.

It may make sense also to evaluate if the whole range of data storage products up to high end products shall be included into the Energy Star scope. To reduce complexity of the specification, the focus may need to be on products with high market relevance and significant options for implementation of energy efficiency features.

Line 464–473 – List of Excluded Products: We agree on with the list of excluded products. We think however that NAS for home purposes should be excluded as well. Either by excluding home storage products in general or by excluding storage products with less than e.g. two disks. We think that the exclusion of “Personal / Portable Data Storage Products” is not sufficient, because it may be interpreted as products connected to the individual computer and not products connected to the home network.

Line 477 – Power Supplies: We believe that experience from power supply requirements for servers should be used for the developments for data storage equipment. We share the view that it would be important to support right sizing of power supplies. In this context we propose to evaluate options for a requirement concerning the provision of different sizes of power supplies allowing optimized energy efficient hardware configuration. Different types of power supplies should also be offered in online hardware configurators.

Line 485–488 PSU Load Points: We agree in the load points proposed for requirements. Additionally, we recommend to consider including an information requirement on 0 % load in order to be able for the purchasers to know the full load curve and the idle losses.

Line 519 – Criteria for Idle and Low Power/Sleep: Currently, there are no criteria for low power modes indicated. We strongly recommend to include possible low-power-modes. The power management features indicated in the text should also be based on some common definitions for low power modes.

Line 538 – Product Information Requirements: Information on power consumption in active, idle and standby/sleep (low power) should be required.

Line 567 – Information Requirement on Benchmark Results: We recommend to evaluate the latest developments for available storage benchmarks (e.g. SPC) as a basis for the decision if an information requirement on benchmark reporting makes sense at this stage.

Line 595 – Accuracy Level: The proposed 10 W accuracy level for power levels below 200 W seems rather weak. We believe that a general 5 % level should be feasible.

Line 603 – Sampling Requirements: We agree that it is important to include a rolling average because true energy measurements where power is integrated, is always preferable. Else varying power can result in very different measurement when a periodical sampling is used if for example the sampler all the time hits all the high power peaks.