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US Environmental Protection Agency

Greetings

HP is submitting the following comments on the proposed ENERGY STAR® (ES) requirements for Imaging Equipment, version 2.0, Eligibility Criteria-Draft 1.

Program Level Comments

EPA continues its historical practice to make significant program changes while allowing minimal time for stakeholders to properly evaluate the changes and provide thoughtful comments. In the future, we request the EPA provide at least one month for adequate consideration of each significant updates to ES documents and processes.

HP continues to think EPA's fundamental implementation of the energy efficiency program is flawed. EPA's stated goal is to cut 75% of affected product models out of the program with each new update. Also, EPA only provides a nine-month grace period for industry to respond. Since the majority of imaging products take far longer than nine months to develop (some up to 4 years) lack of visibility to new rules is damaging to a majority of products.

Although the ES program is referred to as a voluntary program, it really is closer to being a regulatory program. We have this view since non-qualifying products for both circumstances can lose significant sales to the US governments and other entities. The outcome from the ES program is arguably worse than regulation since ES has been adopted in many countries worldwide, and these countries also use ES qualification as a requirement for their green-procurement rules.

Since the ES imaging program is now in its 20th year, all future improvements to efficiency are expected to be expensive, time consuming and resource intensive because all the "easy" fixes were made long ago. So EPA's adherence to cutting 75% of the products and providing negligible time to react will very likely result in a significant negative impact to the imaging products industry.



In order to improve collaboration and remedy these concerns we recommend the following:

- EPA should increase the percentage of products that pass rule updates.
- EPA should provide better visibility to rule updates.
- For example, when EPA completes the V2.0 rules it should consider a two tier implementation:
 - Tier 1 should consider setting limits allowing 50% of the current products to meet the V2.0 rules beginning one year after the rules are completed and published.
 - Tier 2 should consider setting limits to allow 25% of the current products to meet the V2.0 rules beginning two years after Tier 1 comes into effect (3 years after the rules are completed).
 - From that point forward, the EPA should establish rules that provide at least two years visibility before being implemented.

General Comments

Line 88: Change the reference of “primary functional adder” as this term is no longer proposed to be used.

Line 181: The definition of Representative Model seems fine.

Line 198: Does the inclusion of functional adders within the Product Family scope apply to all imaging products or just OM products? If it does not apply to all products then there is a problem. For example, an identical set of TEC products with and without fax would seem to not be considered in the same product family. Also we have some concern this definition could easily become obsolete as new features are added to products in the future. This may become a problem if the Certification Bodies (CB) rigidly enforce the definition.

Line 218: HP supports the proposal to include small format high performance inkjet devices (HPIJ) into the TEC method. Standard format HPIJ devices have been included in the TEC method for a few years. The imaging technology used is the same regardless of the media size.

Line 240: We request the EPA include some examples of rounding in the document to ensure it is done properly. For example:

- If the measured TEC value for a product is 6.48 and the limit is 6.7, then we assume we round to measured value to 6.5.
- If instead the limit is 6.75, then we assume we would round the measured value to 6.48.
- If the measured TEC value is 6.55 and the limit is 6.6, then do we round the measured value to 6.5 or 6.6?
- Last, if the measured TEC value is 6.64 and the limit is 6.6, then do we round the measured value to 6.6?

Line 244: It seems the two bulleted items for EPS are mostly redundant and could be consolidated into one comment.



Line 261: We are concerned the proposed “wakeup” definition may create problems with the CBs. Because the wording says the product “shall” not wake, we think CBs may wish or be forced to prove this and it could become a problem. Our recommendation is the EPA change the wording to “should”. It also seems that testing the default shipping configuration of the product would capture any higher power usage of these undesirable wake events, so we are not sure this is a significant issue.

Line 277: HP supports the approach to treat DFEs similarly to small scale servers. We also support the power limits for Type 1. However, we do not support the creation of different allowances for Type 2 DFEs. The reason, as we will explain below, is we want EPA to change the measurement of products with these DFEs to measure the system AC power (DFE + Marking Engine) rather than measuring the components separately. Hence, we support the use of the EPA’s proposed 50 and 60W levels for both Type 1 and Type 2 DFEs.

Line 290: HP cannot comment on the concept of providing recovery time data to consumers until EPA explains what recovery time they are considering. Please define this.

Line 295: HP is not in favor of the proposed change to the auto duplex rules for these reasons:

- The current auto duplex requirements have been in place for a number of years. One might think this means no progress has been made in this area, but that is not true. Since TEC product speeds have increased over time, more products have moved up into the “optional” and “standard” auto duplex requirements.
- We do not think a significant portion of individual consumers are willing to pay more for standard auto duplex when looking for an effective but inexpensive product. These products tend to be monochrome products in the 18-25 PPM range.
- That situation is enhanced when you realize most manufacturers design their products for worldwide use, and consumers in developing countries seem particularly motivated by cost when purchasing products.
- HP has a number of products in this speed range with excellent TEC performance. If EPA implements this rule we likely would not add standard auto duplex to these devices since the market would not support it. Hence, the outcome would be a number of very energy efficient products would be removed from ES qualification and not available for group required to buy ES qualified products.
- We recommend the EPA retain the existing auto-duplex rules.

Line 382: HP does not support the consolidation of all the TEC requirements into two categories, based on color/monochrome printing, for the following reasons:

- We think there are energy use differences in these products (copiers, digital duplicators, fax, MFDs, and printers) and by consolidating them it will be more difficult for the EPA to accurately align the TEC equations to meet their stated qualification level (currently top 25%) for each product category. The outcome of this would be that some product



categories may have more lenient limits while others have more difficult limits. We do not think this would be fair.

- We also think it makes it much more difficult for the EPA to set limits so as to strive to have the qualification level (top 25%) evenly distributed across the various speed ranges. Once again this would lead to some product speed segments having more lenient limits while others have more challenging limits.
- Having unique and accurate TEC limit equations for the various product categories and their monochrome/color print capable is not a burden for industry.

Line 382: HP has analyzed the dataset EPA used to establish the proposed TEC limits. We looked at the impact of the proposed limits for printers and MFDs and we have the following concerns:

- Although the overall qualification rate is 26.3% by our calculations, the monochrome MFD category results are only 20%. We think this result is too low and the EPA should modify the limits so they are 25% or greater.
- HP stratified the printer and MFD product data into qualification levels based on speed ranges that we selected. The results show significant differences. One example of this is for the color printers where the four speed ranges investigated had product qualification levels of 62.5%, 17.1%, 12.3%, and 44%. We do not think that level of variability is appropriate or fair. We request the EPA revisit the TEC limits and ensure the various speed ranges have 25% or more qualification levels.
- There are other examples of the issues shown above in the HP analysis results which are in the file embedded below.
- HP suspects similar issues could be present for the other products categories which HP did not have time to analyze.



Printer_MFD Data
Summary.xlsx

Line 389: HP agrees that setting a default delay time is not warranted at this time.

Line 399: HP agrees with EPA's proposal to not establish a recovery time requirement for OM products.

Line 409: HP requests the EPA modify its treatment of Type 2 DFEs in the following ways:

- Move away from separately measuring the DFE and marking engine power to measuring the overall system power (measured at the power plug).
- Establish a new system level Sleep power limit based on the following:

$$\text{System Sleep Limit} = \text{Type 2 DFE Ready Power Allowance} + \text{Base Marking Engine Sleep Allowance} + \text{Functional Adders}$$



- For example, the system Sleep limit for a Type 2-Category A DFE for a large format ink-based MFD with LAN (1GB) would be 55.4W (50 + 4.9 + 0.5).
- This recommendation eliminates treating the Type 2 DFE and marking engine separately for both TEC and OM products. Therefore, sections 3.3.2 and 3.4.2 would need modification to recognize the change.

Line 409: HP recommends changing the treatment of Type 2 DFEs because it would eliminate a number of problems and provide the following benefits:

- It would greatly simplify third-party testing for both qualification and verification test stages required by the EPA. Type 2 DFEs are typically attached to the inner workings of complex products. In that situation it is essentially impossible for an independent test facility to know how to access the DFE (product disassembly) and where to attach probes to complete the test for DC power. Even with detailed documentation from the product manufacturer, improper handling and damage to the product are likely.
- System Sleep mode measurement and reporting would be accurate and truly representative of the power being used by the device. This would eliminate the current confusion many customers experience trying to understand the true power performance of their product. This would enhance their ability to make a better product purchasing decision by comparing the real system level power usage. It would also minimize customer confusion in understanding product data sheets by providing one Sleep power number instead of one that may include both AC (marking engine) and DC (DFE) power numbers.
- It would avoid potential gaming of the methodology. There is the potential with the current proposal that manufacturers could push certain product capabilities into the Type 2 DFE to make it easier to meet the marking engine OM limit.

Line 455: How is the number 2.55W to be rounded to the nearest 1/10th W?

Line 471: HP has a number concerns with the base marking engine power allowances; including:

- The Sleep allowance for standard format ink fax, print, and MFDs is 0.6W. This is interesting because the EPA is proposing a 0.5W Off mode allowance. By this reasoning the EPA is effectively allowing only 100mW for the engine to be powered in Sleep. We do not think this is appropriate.
- There is some information within the standard format ink printers and MFD EPA data that looks questionable, and we request the EPA review this data. If this data is in error, then EPA should recalculate the power allowances. The data is shown below in the embedded file.



- For standard format ink based MFDs there are 14 products where the Sleep mode power is greater than the Ready mode power. There are 16 instances of this for standard format ink based printers.
- For standard format ink based MFDs there are 6 products where the power level for Ready, Sleep, Off and Standby are identical. There are 5 instances of this for standard format ink based printers.



Ink OM Data
Analysis.xlsx

- EPA has proposed limits of 7.4W for large format (LF) copiers, 7.4W for LF MFDs, and 9.0W for small format printers. It seems inconsistent the EPA should propose only 4.9W for LF printers when there are similarities with these product categories.
- HP obtained additional data from a third-party source which indicates the LF ink market is larger than EPA identified. Based on this data, our review indicates the base marking engine allowance for these products should be 13.3W instead of 4.9W. A summary of the analysis is embedded below. We will provide the full data set separately to the EPA.



Large Format Ink
Market Data Summary

- HP is concerned USB-powered scanners, with a maximum power use of 2.5W and with a limited performance and features, are inappropriately forcing the scanner base marking engine allowance down. We request the EPA consider taking steps ensure the base marking allowance is fair across the range of scanners. One option we would support is to allow all USB-powered scanners to meet ES. Then establish a base marking engine allowance for the remaining products, without including the USB-powered scanners.

Line 474: HP has the following comments on the functional adder topic:

- We believe EPA's proposed adders when coupled with the base marking engine allowance will favor less capable products (lower performance and lower featured products) to qualify to ENERGY STAR.
- EPA's action to limit the number and type of functional adders is synonymous to directing product manufacturers on the design and features we can provide our customers. Although EPA mentions in line 489 they intend to power down "non-



essential" functions, the proposed adders will limit current product designs and may inhibit the deployment of new features on future products.

- EPA limits current products by not recognizing that faster products require more power than slower products. For example, a fast product may require 40W to operate compared to a slow product that requires 10W. The higher performance product will incur higher energy losses in its power supply in Sleep. Because the EPA has not accounted for this, this will result in the lower performance products having a greater likelihood for qualification.
- Another example occurs when a higher featured product with a touch-based control panel would have to completely power-off the panel and its touch sensor in order to compete with a lower capable device without the same feature. EPA should not ignore legitimate adders that account for extra performance and features in the wide range of OM products in the market.
- HP sees two options to account for the energy needed in higher performance products:
 - Reestablish the power supply functional adder that existed in the V1.2 rules. This would offset the extra power associated with the power supply that supports higher speeds and some higher performance features not captured by the EPA. For example, a product like this would have higher powered ASIC necessary for more image processing tasks.
 - If EPA prefers another method, such as providing an allowance based on product speed, we would be open to the concept. A speed-based adder may be a challenge to develop without Sleep data tied to ISO-based speeds.
- To account for the control panel example we provided, we request the EPA establish a new non-interface functional adder of 0.2W for this feature. This power would support leaving the touch sensor powered in Sleep so the user can wake the product from Sleep when they directly interface with it.
- EPA eliminated the allowance for disk drives. It is our understanding disk drives use around 0.15W in Sleep. EPA should reinstate this adder.
- The memory allowance needs to include the per gigabyte reference.

Line 506: EPA's reason for eliminating power supplies as a functional adder seems to miss the mark. EPA states they are aware some power supplies can achieve levels of 0.1W in no-load mode (not connected to the product), and that justifies eliminating the Sleep mode adder for this device. Sleep mode is different than Off mode because the supply is connected to the product and it is delivering power.

Line 543: HP agrees with the proposal to remove the DFE power supply efficiency requirements.

Line 547: HP recommends the EPA eliminate section 3.6. We think the ES program which has focused exclusively on product energy use should retain that focus and not wander into other obscure criteria. Moving into completely new issue categories could erode the ES brand. These



requirements are also covered by other programs already, and we see no benefit to redundancy. It also is not clear whether the EPA could actually dictate the CBs to ignore verifying whether these proposed requirements are really met or not.

Should the EPA disagree with our view, then at a minimum the EPA should cite the European Union's Restriction of Hazardous Substances law rather than writing its own text which will likely fail to match the details of the EU law, and thus create problems.

Line 620: HP agrees with the proposal for testing one unit for each representative model.

Line 626: We recommend the EPA begin to develop a list of major topics that are likely to be reviewed in the next major of these rules (V3.0). For example:

- Consideration to remove scanners and fax devices from the program scope.
- Recommendation that manufacturers consider strategies for implementing key elements of the PZ protocol (ECMA-393).

Additional Comments

EPA has raised the concept of adopting the ProxZzzy (PZ) power management methodology as it could apply to DFEs. We have the following thoughts on this proposal:

- HP supports ProxZzzy or similar concepts of low power management methodology of hosts. HP is committed and are constantly working towards an energy efficient DFEs.
- PZ is not possible with any architecture today. The DFE and imager states do not match, as there is a need for part of the DFEs to be on to enable functionalities.
- Release of ECMA-393 was in 2010, the development cycle to implement a protocol with hardware takes at least 3 years, which is not feasible for V2.0 of ENERGY STAR.
- The existing PZ spec (three mandatory protocols) would not provide the necessary savings as the host would wake up very frequently because the existing chip sets do not control this well.
- Going beyond the three mandatory protocols in PZ, the hardware does not exist today.
- Windows 7 and other OS supports similar Ppotocols but its neither very mature nor is it supported by most hardware manufacturers yet.
- We recommend not implementing a specific protocol (PZ). But instead limit power levels. This would achieve positive results while allowing product manufacturers the flexibility to make those improvements in the best manner for their products.

March 7th Meeting

HP requests the EPA come prepared for the meeting to discuss the following topics:

- Show the impacts of the proposed TEC limit equations on each of the affected product types. Also include the impacts based on the speed ranges within each product category.



- How EPA arrived at the various proposed OM base engine and functional adder allowances?
- What steps did EPA take to strive to provide power allowances for higher performance and featured OM products?
- Discuss the motivation behind changing the auto-duplex rules.
- How did EPA evaluate product categories that might contain a significant number of USB-powered devices?

HP appreciates this opportunity to comment.

Regards,

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