Subject: Comments to Proposed Digital Front End (DFE) Changes for Final Draft Version 2.0 ENERGY STAR Imaging Equipment Specification

To whom it may concern:

As this is our final "ENERGY STAR Product Specification for Imaging Equipment Version 2.0" comments, we would like to thank the EPA for listening to our previous concerns and providing equitable solutions. Now unlike our previous correspondences where numerous Digital Front End (DFE) issues were raised and discussed, here we want to focus on a single issue where an imaging equipment's certification is invalidated when a higher power DFE is added to a product family.

Throughout the ENERGY STAR Imaging Equipment Specification revision process there were numerous discussions as to whether higher DFE power equates to a higher imaging equipment TEC (Typical Electricity Consumption) value. Some illustrative examples used in the past included a low power DFE which was connected to a Digital Copier capable of generating 80 images per minute (ipm); but because of the components chosen to construct the low power DFE (e.g., low clock rate CPU, small amount of memory, etc.) this DFE was only capable of driving the imaging equipment at 45 ipm. Whereas if the imaging equipment was paired with a higher power consuming DFE that was capable of driving the imaging equipment at its designed maximum rate, the overall TEC could be lower, since jobs are finished faster which in turn allows the unit to enter sleep sooner resulting in lower power consumption. *To be fair, during these same discussions data was also presented that showed there were some DFEs on the market that consumed an excessive amount of energy, which negated all the energy savings generated by the sleeping imaging equipment. And as a result of this complex interaction between imaging equipment and DFE power consumption, it was decided that both the DFE and imaging equipment TEC values should be measured and reported*.

Another point raised during those DFE discussions was not all DFEs which may ultimately be sold with a given imaging equipment are available when the imaging equipment has to be tested for ENERGY STAR certification. For example, an imaging equipment manufacturer may choose to support only one Type 1 DFE when the system was being designed. But after the imaging equipment enters the market, customers may demand another DFE choice based on features and/or price. At this point if this new DFE choice consumes the same or less power than the DFEs currently listed with the product, as determined by the imaging equipment manufacturer, it is simply added to the list. But if the new DFE consumes more power, the family certification is invalidated and the imaging equipment plus the new DFE must be shipped to a Certification Body (CB) for recertification (a very expensive process).

Even though Electronics For Imaging, Inc. (EFI) is the leading third party DFE manufacturer, we are frequently asked to provide DFEs for imaging equipment that has already entered the market. While in most cases the DFEs produced by EFI for an existing imaging equipment model will consume less power than the system it replaces, there is a possibility our DFE will consume more power simply because we are trying to maximize the imaging equipment's job delivery rate/performance. Now instead of simply invalidating the imaging equipment's family certification whenever a higher power DFE comes on to the market (a DFE which may actually lower the imaging equipment's TEC value), we propose instead that the imaging equipment manufacturer internally measure the imaging equipment connected to the new DFE. And if the difference between the currently reported and new imaging equipment TEC value is less than some percentage determined by the EPA/DOE (e.g., ten percent), then the DFE is considered part of the current imaging equipment family and can be simply added to the list. Otherwise if the imaging equipment manufacturer desires this configuration to be ENERGY STAR certified, then a new family would need to be created, and the imaging equipment plus DFE would need to be shipped to and certified by a CB. Please note in this proposed change, the new DFE must still meet the maximum TEC_{DFE} requirements set forth in Table 2 of the ENERGY STAR Imaging Equipment Specification (i.e., the amount of power that a DFE can consume is not unbounded, regardless of how much it lowers the imaging

equipment's TEC value). In addition, all imaging equipment family related rules would also have to be followed for a DFE to be considered part of the representative family.

This proposed change also prevents a major potential issue which can occur when a DFE affects the imaging equipment's TEC. By extending the example above with some fictitious TEC and TEC_{DFE} values, the following hopes to illustrate the problem associated with simply looking at TEC_{DFE} to determine the best energy saving imaging equipment configuration. In this example, assume that the higher power DFE has a TEC_{DFE} value of 9 kWh/week and the imaging equipment has a TEC value of 50 kWh/week; and that the lower power DFE has a TEC_{DFE} of 4.5 kWh/week but because this DFE is less efficient at delivering job pages, the imaging equipment TEC jumps to 75 kWh/week. Now under the current ENERGY STAR Imaging Equipment rules, where the highest power configuration is tested, the Qualified Products List (QPL) would list the imaging equipment TEC as 50 kWh/week, along with two Type 1 DFEs consuming 9 kWh/week and 4.5 kWh/week. A consumer looking to purchase the most energy efficient combination would incorrectly determine they should choose the 4.5 kWh/week DFE, even though this combination results in a actual weekly energy consumption of 79.5 kWh. Whereas if the consumer chose the higher power DFE their weekly energy consumption would be 59 kWh. Please note that under the current rules there is no way to determine that the lower power DFE affects the imaging equipment's TEC (lower is considered better), so it is simply added to the QPL. Now under the change proposed above, all DFEs are tested by the imaging equipment manufacturer to determine what effect if any the DFE has on the imaging equipment's TEC. And in the above example since the TEC difference using the two DFEs is greater than the allowed family deviation percentage, then the imaging equipment manufacturer would submit the new overall lower power combination to a CB for testing and inclusion on the QPL.

We think the above proposed change is fair and equitable, and only requires imaging equipment family recertification when the variance between DFEs exceeds a preset percentage, and it prevents a customer from selecting an imaging equipment plus DFE combination that consumes more power than the QPL entries imply.

Should you have any questions or concerns with the comments presented above, please feel free to contact me by email or telephone.

Regards,

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