Topic	Subtopic	Comment	EPA Response
3D Printers		Six stakeholders opposed the inclusion of 3D printers in the Imaging Equipment specification, as both the products and stakeholders are different from those currently in scope. However, four stakeholders suggested investigating a new ENERGY STAR category for 3D printers, one noting the increasing sales and opportunity for the ENERGY STAR program to have an early impact.	EPA is proposing to remove 3D printers from the Imaging Equipment specification development effort and may consider these products under a separate scoping effort at a future date.
Best Practices	Maximum machine delay time	One stakeholder supported a maximum machine delay time requirement as helpful to energy savings. Two others did not support this, as: - 4-hour limits are already standard, and - The Blue Angel program requirements already cover machine delay time.	Although 4 hour limits are already standard, additional energy savings could be achieved by decreasing these requirements. EPA is therefore proposing to harmonize the maximum machine delay time requirements for Operational Mode (OM) products with those in the Blue Angel requirements and extend them to all Imaging Equipment products. The Blue Angel requirements are 1 or 2 hours, depending on product speed.
Best Practices	Recovery Times	One stakeholder commented in favor of specifying maximum recovery times from sleep, similar to the Blue Angel program, as long resume times may encourage stakeholders to disable energy saving settings.	As most ENERGY STAR certified Imaging Equipment products already meet the maximum values for recovery time set by Blue Angel, EPA has adopted a similar maximum recovery time requirement for both OM and TEC products. Furthermore, a recovery time requirement ensures a quick wake-up for Imaging Equipment, resulting in greater energy savings and increased customer satisfaction. EPA also believes that enacting this requirement will help keep this functionality engaged and provides greater harmonization with other programs.
Best Practices	Alerts	Two stakeholders commented against alerts when changing settings that affect energy consumption, as - Almost any change in settings has an impact on energy consumption so alerts would be ubiquitous, and - High-end products already provide alerts, so there is already a competitive advantage to providing this feature.	EPA thanks stakeholders for their comments and has determined to not pursue any requirements around user alerts at this time.
General	Timeline	Two stakeholders argued that the proposed specification revision timeline is too aggressive due to the network activity test and the change of connectivity priority of Wi-Fi over USB, both of which could require more data collection to set correct limits.	Due to the complexity of developing the proposed test method updates, the development timeline has been extended into 2018. In addition, EPA has reduced the number of changes to the ENERGY STAR test method. After investigating the impact of changing the priority of Wi-Fi over USB, EPA noted that only nine TEC products on the currently certified product list would be impacted.

Topic	Subtopic	Comment	EPA Response
Maintenance Modes		One stakeholder noted that maintenance modes have potential impacts on energy use. The proposed test method suggests that all maintenance modes be disabled during the test but excessive waking of the imaging equipment from lower power modes to perform maintenance tasks can impact the product's efficiency. The stakeholder proposed an addition to the TEC calculation to include the duration and frequency of maintenance modes and the average power demand.	EPA has investigated the prevalence of maintenance modes and concluded that for most products, the maintenance modes are short enough in duration to not significantly affect energy consumption. Therefore, EPA proposes to continue to exclude maintenance modes from the test. EPA welcomes any further data regarding this issue.
Power Supplies		One stakeholder noted that verification of the power supply allowance sometimes requires invasive inspection of the imaging equipment and recommended this allowance for internal power supplies.	EPA found through regression analysis that the power supply size has an impact on sleep mode power consumption on a manufacturer-by-manufacturer basis (after controlling for other adders). Additionally, EPA investigated other, easier to verify features to achieve similar results, such as product speed and maximum paper width, but could not find an equivalent metric that would be more easily verifiable. Therefore, despite the difficulty in verification testing, EPA is proposing to retain the allowance.
Product Updates and Component Variation		One stakeholder commented that the power of products will change throughout a model's lifetime due to firmware changes and that EPA should consider the currency of data when developing the Version 3.0 specification.	When developing the Version 3.0 specification, EPA only analyzed Imaging Equipment models that have been available on the market since 2013 to ensure data relevancy.
Professional Products	Definition	Stakeholders agreed with the proposed definition criteria and encouraged further validation through market research. One stakeholder commented that there is typically a clear differentiation between commercial products and professional products in manufacturers' catalogs. One stakeholder suggested that EPA should make it clear that the proposed professional product category is limited to TEC products.	EPA has proposed a definition for Professional Imaging Products based on industry recommendations to differentiate heavy-duty products that produce copies for sale, which will have different test and energy requirements. EPA believes that this definition better differentiates these heavy-duty products than that presented in the Discussion Document, which stakeholders indicated could encompass some non-professional products.

Topic	Subtopic	Comment	EPA Response
Professional Products	Scope	Stakeholders were generally opposed to excluding professional products from the scope of the ENERGY STAR specification. One stakeholder commented in support of a separate category for professional products, as they are likely to use a considerable amount of energy. One stakeholder suggested that given the ENERGY STAR program's prominence among government purchasers, EPA should investigate the extent to which government institutions use professional products to decide whether to include them in scope.	EPA is utilizing the Draft 1, Version 3.0 specification defines Professional Imaging Products and the associated Draft 2 test method to solicite early feedback on these products to ease the incorporation of these products at the appropriate time. Professional products will continue to be eligible for ENERGY STAR certification as in V2.0. However, EPA intends this to be temporary until International Organization for Standardization (ISO) Standard 21632 "Graphic technology -- Determination of the energy consumption of digital printing devices including transitional and related modes" is finalized, along with recommended job structures that can form a TEC metric for Professional Imaging Products. This will allow EPA to focus on the core of the imaging equipment specification—the OM and TEC products—in Version 3.0, and add Professional Imaging Products once the test method is finalized and test data is available to set appropriate criteria. EPA welcomes stakeholder feedback on the job structure proposal and on all Professional Imaging Product proposals in the specification and test method. EPA acknowledges that government purchasing is an important driver of ENERGY STAR products, but is not the only driver. Therefore, given stakeholder interest and the energy consumption of these products, EPA plans to continue investigating these products for inclusion within the ENERGY STAR scope.
Professional Products	Requirements	One stakeholder suggested that further reduction of TEC limits for professional products would make it nearly impossible to qualify. As such, this stakeholder suggested that professional products could be retained on the qualified products list by either 1) freezing the requirements for higher speed ranges where most professional products fall, or 2) if version 3.0 includes a definition for professional products, adapting the version 2.0 requirements in version 3.0 for these products.	Professional products will continue to be eligible for ENERGY STAR certification as in V2.0. EPA intends to use the Version 3.0 specification development process to solicit stakeholder feedback on these products. Once test data have been collected, EPA will propose criteria levels. This may be part of the Version 3.0 process or a separate V3.1 process depending on when data can be collected and analyzed.

Topic	Subtopic	Comment	EPA Response
Professional Products	Duty Cycle and Testing	One stakeholder informed EPA of ISO 21632, a test method for professional products (currently under development) that focuses on energy efficiency during continuous printing. One stakeholder confirmed that the duty cycle of professional products is higher than that of typical office equipment; the owners often maximize usage by operating multiple shifts. Another stakeholder commented that while the TEC test method may not be ideal for professional products, it is still a standardized way to generally compare energy consumption and highlight the most efficient performers. This stakeholder noted that adding a separate test method and requirements for professional products would significantly delay the timeline.	EPA understands Professional Imaging Products differ from Imaging Equipment intended for office use, and that the current ENERGY STAR TEC test method is not representative of these products. As such, EPA has proposed a new test method for Professional Imaging Products that references ISO 21632. However, ISO 21632 is currently under development and a Draft International Standard (DIS) has been released for a vote in December 2017. EPA does not expect significant changes to the standard at this stage and is therefore proposing language referencing the standard in key places for feedback in the test method. EPA will verify and update all references once the final standard is published later in 2018.
Refillable Ink Tanks		Six stakeholders argued that promoting refillable ink tanks are outside of the scope of ENERGY STAR, which should be focused on energy and energy efficiency. Two noted that refillable ink tanks could have higher environmental impacts, and their benefits are speculative without a life-cycle analysis (LCA). One stakeholder commented with strong support of EPA's proposal to look further into the use of refillable ink tanks, as -Non-refillable cartridges involve additional embodied energy, and the consumables used during the operation of imaging equipment can have a large contribution to the overall environmental impact -Duplexing is a precedent for non-energy requirements	EPA reviewed Life Cycle Analyses that included life-cycle costs and environmental impacts of a standard printer versus one that utilizes a refillable ink tank. EPA concluded that, at times, the standard printer had a lower life-cycle cost and lower environmental impacts, while sometimes the refillable ink tank printer fared better. Results are dependent on usage. Given consumer usage variance, it is difficult for EPA to amend the program to require this capability. As such, EPA is proposing to include this information as a reporting requirement to allow consumers with interest in this capability to identify those ENERGY STAR products that offer it.
Scope Exclusions	General	Two stakeholders recommended conducting further market research and calculating market penetration before proposing to exclude other products. One stakeholder noted that the regular ENERGY STAR process of identifying top performing products would work better than excluding categories of products outright. One stakeholder commented that faxes, copiers, and mailing machines should not be excluded as long as they're being sold.	Additional data regarding digital duplicators was received, which indicates that these products have a unique role within the market and the market is innovating to reduce energy consumption. Therefore, EPA has kept digital duplicators within scope. Mailing machines were retaind within scope. There are new products being certified and there is still the potential to differentiate the highest performing products on the market.

Topic	Subtopic	Comment	EPA Response
Scope Exclusions	Digital Duplicators	Three stakeholders disagree with the proposal to exclude digital duplicators, citing the needs of the EPEAT program. One stakeholder noted continuing shipments, variety of users, and technical and energy efficiency innovations.	However, stand-alone fax machines and copiers have been excluded from scope. Due to the drop in shipments of these products, there is a lack of incentive to invest in these products.
Scope Exclusions	Fax Machines	One stakeholder agreed with the exclusion of stand-alone fax machines.	
Scope Exclusions	Copiers	Two stakeholders agreed with the exclusion of stand-alone copiers.	
Sleep Mode Power Requirement		Two stakeholders commented in favor of harmonizing network standby requirements with others, such as those in EU Energy-related Product (ErP) Regulations, specifically Lot 26 (network standby, which is equivalent to Sleep Mode for networked products).	The EU set three tiers of network standby requirements: Tier 1 (effective January 1, 2015) required 6 Watts (W); Tier 2 (effective January 1, 2017) requires 3 W; and Tier 3 (effective January 1, 2019) requires 2 W. EPA has not amended the criteria for OM products in Draft 1. However, EPA encourages stakeholders to provide additional feedback if there is interest in harmonizing the network standby requirements with the 2019 requirements.
Standby Power Definition		Two stakeholders agreed with the proposal to change the standby power language, as it would provide further clarity. Four stakeholders argued against the proposal, citing its impacts on international harmonization and lack of value-add. Finally, one stakeholder noted that any definitions should be harmonized, and two others have pointed out how the terms used for low-power modes have changed over time.	EPA has proposed to remove the standby definition in the test method draft section 1.C.4 and change 3.4.5 to an off mode requirement, allowing products that don't have an off mode to qualify using sleep or ready state. This approach is used in other ENERGY STAR specifications, such as Displays, to simplify the specification.
Standby Power Requirement		Two stakeholders commented in favor of harmonizing standby requirements with others, such as those in EU Energy-related Product (ErP) Regulations, specifically Lot 6 (standby, which is equivalent to Off Mode, or Sleep Mode for models without an Off Mode).	EPA has proposed to revise the Off Mode Power requirement (formerly the Standby Power requirement) to .3 W, which harmonizes with the currently proposed European Commission Energy-related Product Regulation Lot 6 (Standby), which would take effect in 2019. The European Commission is conducting a review of this requirement (http://www.ecostandbyreview.eu), and the draft conclusion is that a 0.3 W requirement is feasible.

Topic	Subtopic	Comment	EPA Response
Network Activity Test	Automation	One stakeholder commented that the network activity test method should be straightforward and automatable, so as to remove human error as much as possible.	The network activity test method on imaging equipment was validated in the field with the help of the California Plug Load Research Center (CalPlug). After testing 10 models, CalPlug has been unable to replicate the network wakeup behavior that prompted examination of this issue. All models investigated increased their power only slightly, and returned to sleep promptly when subjected to Simple Network Management Protocol (SNMP) and NetBIOS Network System (NBNS) packets, as well as several other protocols. The only exception is specific user-initiated requests, such as print jobs or Hypertext Transfer Protocol (HTTP) access to the device scan folders or administrative console; however, these activities should not occur outside of working hours when the device is in sleep mode. Therefore, EPA is withdrawing the network activity test method from the proposal, pending additional information on models or protocols that may be affected by unnecessary wakeups.
Network Activity Test	Collaboration	One stakeholder expressed willingness to work/collaborate with other stakeholders to define the best/most complete network activity test method.	
Network Activity Test	Definition of wake-up	Three stakeholders commented that EPA should clarify what constitutes a "wake-up" in the network activity test method, as equipment needs to perform some action to respond to the network packets.	
Network Activity Test	First-minute condition	Two stakeholders mentioned that communication varies in frequency and other parameters, such that the test requirements after the first minute are not sufficiently specified.	
Network Activity Test	Investing Time	Two stakeholders are cautioning that more time must be spent to make sure the network activity test method is fully developed, with one stakeholder noting that it should accurately represent real-world results and the other that it should consider future network technologies.	
Network Activity Test	Repeatability/fairness	Four stakeholders expressed concern about the repeatability of the test method. Two mentioned that the packet frequency and timing would depend on the test environment and noted that SNMP is a protocol which is expanded freely by any manufacturer. Three were concerned with the impacts of the operating system. Two stakeholders further commented that the specific testing tools used could have an impact on results, with one recommending they be specified.	
Network Activity Test	Representativeness	Four stakeholders questioned whether the test will accurately represent typical, real-world office use of imaging equipment, in terms of the duration of the test, the protocol communication tools, packet types, and frequency.	
Network Activity Test	General Test	Two stakeholders commented that EPA should develop a universal network test method for all network-connected equipment rather than focusing on specific types of imaging equipment.	
Network Activity Test	Retesting	Four stakeholders commented that network activity testing would impose a burden, with one noting that additional staff would be required. Two stakeholders requested that currently certified products not be re-tested.	
Network Activity Test	Sleep Test	Two stakeholders commented that Step 5 in the TEC test method (the sleep mode test) not be changed.	

Topic	Subtopic	Comment	EPA Response
Network Activity Test	Usefulness of data	Two stakeholders commented that data from the network activity test will not be useful due to the absence of a wake-up problem. One noted that customers have not complained about wakeups while the other commented that there will be little difference between test results for different equipment.	
Network Activity Test	Using the Data	Three stakeholders asked how network activity test data will be used and whether EPA plans on setting any criteria based on the data. One stakeholder opposed reporting or using the data without the further vetting of the test method.	
Other	Default Delay Time Test	Two stakeholders noted the addition of default delay time to sleep mode measurement in Step 4 of the draft test method and want clarification about the purpose of this change.	Default delay time to sleep mode, $T_{DEFAULT}$, is currently reported to EPA via the Qualified Product Exchange (QPX) system. In the Draft 1 test method, EPA had included this measurement explicitly within the test method. In Draft 2, EPA has clarified this edit with a new variable name and explained it in the accompanying notebox.
Other	Paper Size	A few stakeholders asked EPA to consider testing models sold in Taiwan using A4/70 gsm paper, which is more prevalent there than letter-size paper.	A separate test condition of A4 and 70 grams per square meter was added for testing standard format products sold in Taiwan.
Paper Usage Assumptions	Consumer Education	One stakeholder suggested that if the paper assumptions change, there should be a clear difference between the old ENERGY STAR Imaging Equipment TEC variable and the new one.	EPA has proposed to replace the TEC metric with the TEC_{2017} metric that incorporates the lower print volumes and an annual energy consumption period, to avoid confusion in calculations and messaging.
Paper Usage Assumptions	TEC Formula	Two stakeholders appreciated that EPA was only proposing to modify the TEC formula and not the test method, but noted that changing one but not the other is contradictory. One stakeholder asked that the TEC Calculation for Imaging Equipment with Print Capability be adjusted. The proposed calculation reduces the Daily Job Energy by 4 but the number of print jobs to calculate the sleep time is unchanged, so the result does not reflect an entire 168 hour week. An additional adjustment should be made for products 32 ppm or greater, dividing Nj_{obs} by 16 instead of 4. Finally, two stakeholders commented that simply dividing the daily job energy would affect other modes in addition to active printing, with one arguing that extending periods of sleep mode could increase total energy consumption.	There may be some continuity issues with the change in calculation due to its usage in a variety of areas. However, the Agency notes that the calculation as currently constructed does not provide an accurate representation of the market limiting the accuracy of calculations made off of it. The measured usage shared by manufacturers was reviewed and the same conclusion that the values are too high was reached. To better represent reality, the proposal decreases the contribution of the On Mode in the TEC by a factor of 4, dividing the energy contributions from all jobs (EJOB_DAILY) by a factor of 4 in Equation 5 in the Draft 1 specification and increasing the duration of Sleep Mode by reducing the assumed time spent in On Mode from NJOBS/4 (as each job is assumed to take 15 minutes or ¼ hour) to NJOBS/16 in Equation 3 in Draft 1.

Topic	Subtopic	Comment	EPA Response
Paper Usage Assumptions	Images/Day in Table 11	One stakeholder proposed to delete Image/Day on Table 11: Number of Images per Day Calculated for Product Speeds, s, from 1 to 100 ipm since Images/Day is not used in the TEC Calculation.	The Images/Day has been removed from Table 11 in the test method.
Paper Usage Assumptions	Paper Usage Data	Three stakeholders noted that EPA's proposal to change the paper usage assumptions were based on limited data. Two of these stakeholders further commented against changing the assumption due to: - A lack of impact on product ranking; and - A break in continuity with past estimates and other programs, such as Blue Angel. The stakeholder also commented that EPA request more data, with one noting that the current assumptions reflect their usage. Finally, two stakeholders commented on paper consumption trends, with one noting that it has decreased, while another noting that paper consumption varies by market and region, so it is difficult to ascertain a general trend, but that colorant use has increased.	EPA understands that there is limited data in this space, but believes that all of the data presented to date indicates that paper usage has decreased. EPA notes that there may be regional differences in paper consumption, but is seeking to obtain a national average, which the Agency believes the data collected to date can provide.
Paper Usage Assumptions	Sensitivity	One stakeholder commented that the manufacturer-provided data on average usage excludes imaging profile (i.e. how many imaging jobs are conducted and how many images are produced) and proposed a sensitivity impact to measure the impact imaging job profiles may have on overall TEC.	The existing job structure was retained but the Agency welcomes additional data from manufacturers on the impacts of job structure on TEC and typical job structures in the field.

Topic	Subtopic	Comment	EPA Response
Product Speed		Several stakeholders supported the inclusion of international standards (i.e. International Organization for Standardization (ISO)/Blue Angel) to measure product speed, with one noting that allowing manufacturers to claim highest speeds leads to inconsistency. One stakeholder mentioned that for electro-photographic equipment, the speed value should be selectable between ISO Estimated Saturated Throughput (ESAT) and the manufacturer's nominal speed value (ESAT would be consistent with the Blue Angel definition of speed). Another stakeholder proposed to use the ESAT value rounded down to an integer; however, this should still be a declaration and not a test. However, one stakeholder opposed the change as manufacturer declaration based on external standards would be too complicated while not being enforceable, as it would not be tested or verified.	After conducting some research and receiving more feedback and information from different stakeholders, EPA is not proposing to change the product speed reporting requirements from Version 2.0. In particular, most manufacturers that can test to ISO/IEC standard 24734 are already doing so, while others could do so without the requirement. Therefore, rather than proposing a requirement, EPA has included a permanent note providing ISO/IEC 24734 as an example for declaring print speed.
Product Speed	Calculation for Digital Duplicators	One stakeholder mentioned that digital duplicators consist of two different processes (master making and printing) so measuring this product's speed is different than other imaging equipment. This stakeholder asked EPA to review Japanese standards for digital duplicators.	As EPA is no longer considering harmonizing product speed reporting as per international standards, manufacturers of digital duplicators can continue to report their claimed product speeds.
Wi-Fi	Disabling	One stakeholder argued that disabling the Wi-Fi functionality in some imaging equipment products is difficult so the specification should require manufacturers to provide information on how to disable that functionality.	EPA is not proposing to require manufacturers to provide guidance on disabling the Wi-Fi functionality as EPA has found that most manufacturers already provide this information in manuals and on their websites. EPA encourages all manufacturers to provide this information to their customers.
Wi-Fi	Expectations	One stakeholder asked EPA to clarify expectations with Wi-Fi connectivity (similar to what has been done with wired networking).	The network setup instructions based on the ENERGY STAR Displays test method has been proposed for inclusion within the test method.
Wi-Fi	Priority	Three stakeholders agreed with EPA's proposal of prioritizing Wi-Fi connections over USB in the test method.	The priority list in the Draft 2 test method has been retained.
Wi-Fi	Allowances	One stakeholder requested that all of the networking allowances should be reviewed.	The OM product criteria was not changed in Draft 1. However, the scanner adder was incorporated within the base allowances. In addition, EPA requests stakeholder feedback on the need for an adder for cordless handsets or internal disk drives.