ENERGY STAR ® Program Requirements for Imaging Equipment

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Partner Commitments
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Commitment

The following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacturing of ENERGY STAR qualified imaging equipment. The ENERGY STAR Partner must adhere to the following program requirements:

- Comply with current ENERGY STAR Eligibility Criteria defining the performance criteria that must be met for use of the ENERGY STAR certification mark on imaging equipment and specifying the testing criteria for imaging equipment. EPA may, at its discretion, conduct tests on products that are referred to as ENERGY STAR qualified. These products may be obtained on the open market, or voluntarily supplied by Partner at EPA's request.

- Comply with current ENERGY STAR Identity Guidelines and Web-Based Tools for Partners document, describing how the ENERGY STAR name and mark may be used. Partner is responsible for adhering to these guidelines and for ensuring that its authorized representatives, such as advertising agencies, dealers, and distributors, are also in compliance.

- Qualify at least one ENERGY STAR qualified imaging equipment model within six months of activating the imaging equipment portion of the agreement. When Partner qualifies the product, it must meet the specification in effect at that time.

- Provide clear and consistent labeling of ENERGY STAR qualified imaging equipment. The ENERGY STAR mark must be clearly displayed:
  1. Either on the top/front of product or through electronic messaging that is pre-approved by EPA. Labeling on the top/front of product may be permanent or temporary. All temporary labeling must be affixed to the top/front of product with an adhesive or cling-type application;
  2. On the manufacturer's Internet site where information about ENERGY STAR qualified models is displayed. Specific guidance on using the ENERGY STAR mark on Internet sites is provided in the Web-Based Tools for Partners document;
  3. Either in product literature (e.g., user manuals, specification sheets, etc.) or in a separate box insert that provides educational language about the product's ENERGY STAR settings; and
  4. On product packaging/boxes for products sold at retail.

- Update the list of ENERGY STAR qualified imaging equipment models through the Online Product Submittal tool (OPS) on an annual basis at a minimum. Once the Partner submits its first list of ENERGY STAR qualified imaging equipment models, the Partner will be listed as an ENERGY STAR Partner on www.energystar.gov. Partner must provide annual updates in order to remain on the list of participating product manufacturers. If no new models are introduced during a particular year, Partner should notify EPA to ensure its partnership status is maintained.

- Provide to EPA, on an annual basis, unit shipment data or other market indicators to assist in determining the market penetration of ENERGY STAR. Specifically, Partner must submit the total number of ENERGY STAR qualified imaging equipment products shipped (in units) or an equivalent measurement as agreed to in advance by EPA and Partner. Partner is encouraged to provide unit shipment data segmented by meaningful product characteristics (e.g., product type, size, speed, marking technology, or other as relevant) for both the United States (US) and outside of the United States (non-US). Partner is also encouraged to provide total unit shipments for each model in its product line, and the percent of total unit shipments that qualify as ENERGY STAR. The data for each calendar year should be submitted to EPA, preferably in electronic format, no later than the following March and may be provided directly from the Partner or through a third

party. The data will be used by EPA only for program evaluation purposes and will be closely controlled. Any information used will be masked by EPA so as to protect the confidentiality of the Partner.

- Notify EPA of a change in the designated responsible party or contacts for imaging equipment within 30 days.

Performance for Special Distinction

In order to receive additional recognition and/or support from EPA for its efforts within the Partnership, the ENERGY STAR Partner may consider the following voluntary measures and should keep EPA informed on the progress of these efforts:

- Consider energy efficiency improvements in company facilities and pursue the ENERGY STAR label for buildings.

- Purchase ENERGY STAR qualified products. Revise the company purchasing or procurement specifications to include ENERGY STAR. Provide procurement officials' contact information to EPA for periodic updates and coordination. Circulate general ENERGY STAR qualified product information to employees for use when purchasing products for their homes.

- Ensure the power management feature is enabled for all ENERGY STAR qualified monitors in use in company facilities, particularly upon installation and after service is performed.

- Provide general information about ENERGY STAR to employees whose jobs are relevant to the development, marketing, sales, and service of current ENERGY STAR qualified product models.

- Provide a simple plan to EPA outlining specific measures Partner plans to undertake beyond the program requirements listed above. By doing so, EPA may be able to coordinate, communicate, and/or promote Partner's activities, provide an EPA representative, or include news about the event in the ENERGY STAR newsletter, on the ENERGY STAR Web pages, etc. The plan may be as simple as providing a list of planned activities or milestones that Partner would like EPA to be aware of. For example, activities may include: (1) increase the availability of ENERGY STAR qualified products by converting the entire product line within two years to meet ENERGY STAR guidelines; (2) demonstrate the economic and environmental benefits of energy efficiency through special in-store displays twice a year; (3) provide information to users (via the Web site and user's manual) about energy-saving features and operating characteristics of ENERGY STAR qualified products, and (4) build awareness of the ENERGY STAR Partnership and brand identity by collaborating with EPA on one print advertorial and one live press event.

- Provide quarterly, written updates to EPA as to the efforts undertaken by Partner to increase availability of ENERGY STAR qualified products, and to promote awareness of ENERGY STAR and its message.

- Join EPA's SmartWay Transport Partnership to improve the environmental performance of the company's shipping operations. SmartWay Transport works with freight carriers, shippers, and other stakeholders in the goods movement industry to reduce fuel consumption, greenhouse gases, and air pollution. For more information on SmartWay, visit www.epa.gov/smartway.

- Join EPA's Climate Leaders Partnership to inventory and reduce greenhouse gas emissions. Through participation, companies create a credible record of their accomplishments and receive EPA recognition as corporate environmental leaders. For more information on Climate Leaders, visit www.epa.gov/climateleaders.

- Join EPA's Green Power partnership. EPA's Green Power Partnership encourages organizations to buy green power as a way to reduce the environmental impacts associated with traditional fossil fuel-based electricity use. The partnership includes a diverse set of organizations including Fortune 500 companies, small and medium businesses, government institutions as well as a growing number of colleges and universities, visit www.epa.gov/grnpower/.

ENERGY STAR ® Program Requirements for Imaging Equipment

Eligibility Criteria Version 1.1 – DRAFT Final

Below is the DRAFT 1 Version 1.1 product specification for ENERGY STAR qualified Imaging Equipment. A product must meet all of the identified criteria if it is to be qualified as ENERGY STAR by its manufacturer.

1) **Definitions**: Below is a brief description of terms as relevant to ENERGY STAR.

Products

A. Copier – A commercially-available imaging product whose sole function is the production of hard copy duplicates from graphic hard copy originals. The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as copiers or upgradeable digital copiers (UDCs).

B. Digital Duplicator – A commercially-available imaging product that is sold in the market as a fully-automated duplicator system through the method of stencil duplicating with digital reproduction functionality. The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as digital duplicators.

C. Facsimile Machine (Fax Machine) – A commercially-available imaging product whose primary functions are scanning hard copy originals for electronic transmission to remote units and receiving similar electronic transmissions to produce hard copy output. Electronic transmission is primarily over a public telephone system, but also may be via computer network or the Internet. The product also may be capable of producing hard copy duplicates. The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as fax machines.

D. Mailing Machine – A commercially-available imaging product that serves to print postage onto mail pieces. The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as mailing machines.

E. Multifunction Device (MFD) – A commercially-available imaging product, which is a physically-integrated device or a combination of functionally-integrated components, that performs two or more of the core functions of copying, printing, scanning, or faxing. The copy functionality as addressed in this definition is considered to be distinct from single sheet convenience copying offered by fax machines. The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as MFDs or multifunction products (MFPs).

Note: *If the MFD is not a single integrated unit but a set of functionally integrated components, then the manufacturer must certify that when installed correctly in the field, the sum of all energy or power use for all MFD components comprising the base unit will achieve the energy or power levels provided in Section 3 to qualify as an ENERGY STAR MFD.*

F. Printer – A commercially-available imaging product that serves as a hard copy output device, and is capable of receiving information from single-user or networked computers, or other input devices (e.g., digital cameras). The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as printers, including printers that can be upgraded into MFDs in the field.

G. Scanner – A commercially-available imaging product that functions as an electro-optical device for converting information into electronic images that can be stored, edited, converted, or transmitted, primarily in a personal computing environment. The unit must be capable of being powered from a wall outlet or from a data or network connection. This definition is intended to cover products that are marketed as scanners.

Marking Technologies

H. Direct Thermal (DT) – A marking technology that transfers an image by burning dots onto coated media as it passes over a heated print head. DT products do not use ribbons.

I. Dye Sublimation (DS) – A marking technology where images are formed by depositing (subliming) dye onto the print media based upon the amount of energy delivered by the heating elements.

J. Electrophotography (EP) – A marking technology characterized by illumination of a photoconductor in a pattern representing the desired hard copy image via a light source, development of the image with particles of toner using the latent image on the photoconductor to define the presence or absence of toner at a given location, transfer of the toner to the final hard copy medium, and fusing to cause the desired hard copy to become durable. Types of EP include Laser, LED, and LCD. Color EP is distinguished from monochrome EP in that toners of at least three different colors are available in a given product at one time. Two types of color EP technology are defined below:

   a. Parallel Color EP – A marking technology that uses multiple light sources and multiple photoconductors to increase the maximum color printing speed.

   b. Serial Color EP – A marking technology that uses a single photoconductor in a serial fashion and one or multiple light sources to achieve the multi-color hard copy output.

K. Impact – A marking technology characterized by the formation of the desired hard copy image by transferring colorant from a "ribbon" to the media via an impact process. Two types of impact technology are Dot Formed Impact and Fully-formed Impact.

L. Ink Jet (IJ) – A marking technology where images are formed by depositing colorant in small drops directly to the print media in a matrix manner. Color IJ is distinguished from monochrome IJ in that more than one colorant is available in a product at any one time. Typical types of IJ include Piezo-electric (PE) IJ, IJ Sublimation, and Thermal IJ.

M. High Performance IJ – The use of an IJ marking technology in high-performance business applications usually occupied by electrophotographic marking technology. This difference between the conventional IJ product and the High Performance IJ product is denoted by the presence of nozzle arrays that span the width of a page and/or the ability to dry the ink on the media through additional media heating mechanisms.

> **Note**: Based on stakeholders' comments, EPA made a modification to the High Performance IJ definition proposed in Draft 2 by removing the term "thermal" from the definition. In addition, EPA placed the definition of High Performance IJ after the IJ definition for clarity.

N. Solid Ink (SI) – A marking technology where the ink is solid at room temperature and liquid when heated to the jetting temperature. Transfer to the media can be direct, but is most often made to an intermediate drum or belt and then offset printed to the media.

O. Stencil – A marking technology that transfers images onto the print media from a stencil that is fitted around an inked drum.

P. Thermal Transfer (TT) – A marking technology where the desired hard copy image is formed by depositing small drops of solid colorant (usually colored waxes) in a melted/fluid state directly to

the print media in a matrix manner. TT is distinguished from IJ in that the ink is solid at room temperature and is made fluid by heat.

Operational Modes, Activities, and Power States

Q. Active – The power state in which the product is connected to a power source and is actively producing output, as well as performing any of its other primary functions.

R. Automatic Duplexing – The capability of a copier, fax machine, MFD, or printer to automatically place images on both sides of an output sheet, without manual manipulation of output as an intermediate step. Examples of this are one-sided to two-sided copying and two-sided to two-sided copying. A product is considered to have automatic duplexing capability only if the model includes all accessories needed to satisfy the above conditions.

S. Default Delay Time – The time set by the manufacturer prior to shipping that determines when the product will enter a lower-power mode (e.g., Sleep, Off) following completion of its primary function.

T. Off – The power state that the product enters when it has been manually or automatically switched off but is still plugged in and connected to the mains. This mode is exited when stimulated by an input, such as a manual power switch or clock timer to bring the unit into Ready mode. When this state is resultant from a manual intervention by a user, it is often referred to as Manual Off, and when it is resultant from an automatic or predetermined stimuli (e.g., a delay time or clock), it is often referred to as Auto-off.

U. Ready – The condition that exists when the product is not producing output, has reached operating conditions, has not yet entered into any lower-power modes, and can enter Active mode with minimal delay. All product features can be enabled in this mode, and the product must be able to return to Active mode by responding to any potential input options designed into the product. Potential inputs include external electrical stimulus (e.g., network stimulus, fax call, or remote control) and direct physical intervention (e.g., activating a physical switch or button).

V. Sleep – The reduced power state that the product enters automatically after a period of inactivity. In addition to entering Sleep automatically, the product may also enter this mode 1) at a user set time-of-day, 2) immediately in response to user manual action, without actually turning off, or 3) through other, automatically-achieved ways that are related to user behavior. All product features can be enabled in this mode and the product must be able to enter Active mode by responding to any potential input options designed into the product; however, there may be a delay. Potential inputs include external electrical stimulus (e.g., network stimulus, fax call, remote control) and direct physical intervention (e.g., activating a physical switch or button). The product must maintain network connectivity while in Sleep, waking up only as necessary.

Note: *When reporting data and qualifying products that can enter Sleep mode in multiple ways, partners should reference a Sleep level that can be reached automatically. If the product is capable of automatically entering multiple, successive Sleep levels, it is at the manufacturer's discretion which of these levels is used for qualification purposes; however, the default-delay time provided must correspond with whichever level is used.*

W. Standby – The lowest power consumption mode which cannot be switched off (influenced) by the user and that may persist for an indefinite time when the product is connected to the main electricity supply and used in accordance with the manufacturer's instructions[1].

Note: *For Imaging Equipment products addressed by this specification, the Standby power level, or the minimum power mode, usually occurs in Off mode, but can occur in Ready or Sleep. A product cannot exit Standby and reach a lower power state unless it is physically disconnected from the main electricity supply as a result of manual manipulation.*

1 IEC 62301 – Household electrical appliances – Measurement of standby power. 2005.

Product Size Formats

X. Large Format – Products categorized as Large Format include those designed for A2 media and larger, including those designed to accommodate continuous-form media at a width of 406 millimeters (mm) or wider. Large-format products may also be capable of printing on standard-size or small-format media.

Y. Small Format – Products categorized as Small Format include those designed for media sizes smaller than those defined as Standard (e.g., A6, 4" x 6", microfilm), including those designed to accommodate continuous-form media at widths smaller than 210 mm.

Z. Standard – Products categorized as Standard include those designed for standard-sized media (e.g., Letter, Legal, Ledger, A3, A4, and B4), including those designed to accommodate continuous-form media at widths between 210 mm and 406 mm. Standard-size products may also be capable of printing on small-format media.

Additional Terms

AA. Accessory – An optional piece of peripheral equipment that is not necessary for the operation of the base unit, but that may be added before or after shipment in order to add functionality. An accessory may be sold separately under its own model number, or sold with a base unit as part of a package or configuration.

BB. Base Product – A base product is the standard model shipped by the manufacturer. When product models are offered in different configurations, the base product is the most fundamental configuration of the model, which possesses the minimum number of functional adders available. Functional components or accessories offered as optional, rather than standard, are not considered part of the base product.

CC. Continuous Form – Products categorized as Continuous Form include those which do not use a cut-sheet media size, and are designed for key industrial applications such as printing of bar codes, labels, receipts, waybills, invoices, airline tickets, or retail tags.

DD. Digital Front-end (DFE) – A functionally-integrated server that hosts other computers and applications and acts as an interface to imaging equipment. A DFE provides greater functionality to the imaging product. A DFE will be defined as either:

Type 1 DFE: A DFE that draws its DC power from its own AC power supply (internal or external) which is separate from the power supply that powers the imaging equipment. This DFE may draw its AC power directly from a wall outlet, or it may draw it from the AC power associated with the imaging product's internal power supply.

Type 2 DFE: A DFE that draws its DC power from the same power supply as the imaging equipment with which it operates. Type 2 DFEs must have a board or assembly with a separate processing unit that is capable of initiating activity over the network and can be physically removed or disabled using common engineering practices to allow power measurements to be made.

A DFE also offers **at least three** of the following advanced features:

a. Network connectivity in various environments;
b. Mailbox functionality;
c. Job queue management;
d. Machine management (e.g., waking the imaging equipment from a reduced power state);
e. Advanced graphic user-interface (UI);
f. Ability to initiate communication with other host servers and client computers (e.g., scanning to email, polling remote mailboxes for jobs); or
g. Ability to post-process pages (e.g., reformatting pages prior to printing).

Note: The preceding DFE definition incorporates stakeholder comments and discussion from the Web-based stakeholder meeting on August 19. EPA welcomes comments on the proposed definition from all stakeholders.

EE. Functional Adder – A functional adder is a standard product feature that adds functionality to the base marking engine of an imaging equipment product. The Operational Mode portion of this specification contains additional power allowances for certain functional adders. Examples of functional adders include wireless interfaces and scanning capability.

FF. Operational Mode (OM) Approach – A method of testing and comparing the energy performance of imaging equipment products, which focuses on product energy consumption in various low-power modes. The key criteria used by the OM approach are values for low-power modes, measured in watts (W). Detailed information can be found in the "ENERGY STAR Qualified Imaging Equipment Operational Mode Test Procedure" available at www.energystar.gov/products.

GG. Marking Engine – The very basic engine of an imaging product, which drives the image production of that product. Without additional functional components, a marking engine cannot acquire image data to process and is, therefore, non-functional. A marking engine is reliant on functional adders for communication ability and image processing.

HH. Model – An imaging equipment product that is sold or marketed under a unique model number or marketing name. A model may be comprised of a base unit or a base unit and accessories.

II. Product Speed – In general, for Standard-size products, a single A4 or 8.5" x 11" sheet printed/copied/scanned on one side in a minute is equal to one image-per-minute (ipm). If the maximum claimed speeds differ when producing images on A4 or 8.5" x 11" paper, the higher of the two shall be used.

- For mailing machines, one piece of mail processed in a minute is equal to one mail-piece-per-minute (mppm).
- For Small-format products, a single A6 or 4" x 6" sheet printed/copied/scanned on one side in a minute is equal to 0.25 ipm.
- For Large-format products, a single A2 sheet is equivalent to 4 ipm and one A0 sheet is equivalent to 16 ipm.
- For continuous-form products categorized as Small-format, Large-format, or Standard-size, print speed in ipm should be obtained from the product's maximum marketed imaging speed in meters per minute according to the conversion below:

  X ipm = 16 x [Maximum media width (meters) x Maximum imaging speed (length-meters/minute)]

In all cases, the converted speed in ipm should be rounded to the nearest integer (e.g., 14.4 ipm rounds to 14.0 ipm; 14.5 ipm rounds to 15 ipm).

For qualification purposes, manufacturers should report the speed of the product according to the prioritization of functions outlined below:

- **Print Speed**, unless the product cannot perform the print function, in which case,
- **Copy Speed**, unless the product cannot perform the print or copy functions, in which case, and
- **Scan Speed**.

JJ. Typical Electricity Consumption (TEC) Approach – A method of testing and comparing the energy performance of imaging equipment products, which focuses on the typical electricity consumed by a product while in normal operation during a representative period of time. The key criteria of the TEC approach for imaging equipment is a value for typical weekly electricity consumption,

measured in kilowatt-hours (kWh). Detailed information can be found in the "ENERGY STAR Qualified Imaging Equipment Typical Electricity Consumption Test Procedure" available at www.energystar.gov/products.

2) **Qualifying Products**: This ENERGY STAR specification is intended to cover personal, business, and commercial imaging equipment products but not industrial products (i.e., products directly connected to three phase power). Units must be capable of being powered from a wall outlet or from a data or network connection and operate off of the international standard nominal voltage supplies listed in the document **Test Conditions and Equipment for ENERGY STAR Imaging Equipment Products**. In order to qualify as ENERGY STAR, an imaging equipment product must be defined in Section 1 and meet one of the product descriptions in Table 1 or 2, below.

Note: Based on stakeholder input, EPA is proposing to add a clarification to "industrial products" noted in Draft 2 in order to ensure only personal, business, and commercial imaging equipment are included. Stakeholders are encouraged to comment on this clarification.

Qualifying Products: Table 1 - TEC Approach

Product Area	Marking Technology	Size Format	Color Capability	TEC Table	Page
Copiers	Direct Thermal	Standard	Monochrome	TEC 1	12
	Dye Sublimation	Standard	Color	TEC 2	12
	Dye Sublimation	Standard	Monochrome	TEC 1	12
	EP	Standard	Monochrome	TEC 1	12
	EP	Standard	Color	TEC 2	12
	Solid Ink	Standard	Color	TEC 2	12
	Thermal Transfer	Standard	Color	TEC 2	12
	Thermal Transfer	Standard	Monochrome	TEC 1	12
Digital Duplicators	Stencil	Standard	Color	TEC 2	12
	Stencil	Standard	Monochrome	TEC 1	12
Fax Machines	Direct Thermal	Standard	Monochrome	TEC 1	12
	Dye Sublimation	Standard	Monochrome	TEC 1	12
	EP	Standard	Monochrome	TEC 1	12
	EP	Standard	Color	TEC 2	12
	Solid Ink	Standard	Color	TEC 2	12
	Thermal Transfer	Standard	Color	TEC 2	12
	Thermal Transfer	Standard	Monochrome	TEC 1	12
Multifunction Devices (MFDs)	High Performance IJ	Standard	Monochrome	TEC 3	12
	High Performance IJ	Standard	Color	TEC 4	12
	Direct Thermal	Standard	Monochrome	TEC 3	13
	Dye Sublimation	Standard	Color	TEC 4	13
	Dye Sublimation	Standard	Monochrome	TEC 3	13
	EP	Standard	Monochrome	TEC 3	13
	EP	Standard	Color	TEC 4	13
	Solid Ink	Standard	Color	TEC 4	13
	Thermal Transfer	Standard	Color	TEC 4	13
	Thermal Transfer	Standard	Monochrome	TEC 3	13
Printers	High Performance IJ	Standard	Monochrome	TEC 1	12
	High Performance IJ	Standard	Color	TEC 2	12
	Direct Thermal	Standard	Monochrome	TEC 1	12
	Dye Sublimation	Standard	Color	TEC 2	12
	Dye Sublimation	Standard	Monochrome	TEC 1	12
	EP	Standard	Monochrome	TEC 1	12
	EP	Standard	Color	TEC 2	12

Product Area	Marking Technology	Size Format	Color Capability	TEC Table	Page
	Solid Ink	Standard	Color	TEC 2	12
	Thermal Transfer	Standard	Color	TEC 2	12
	Thermal Transfer	Standard	Monochrome	TEC 1	12

Qualifying Products: Table 2 – Operational Mode Approach

Product Area	Marking Technology	Size Format	Color Capability	OM Table	Page
Copiers	Direct Thermal	Large	Monochrome	OM 1	16
	Dye Sublimation	Large	Color & Monochrome	OM 1	16
	EP	Large	Color & Monochrome	OM 1	16
	Solid Ink	Large	Color	OM 1	16
	Thermal Transfer	Large	Color & Monochrome	OM 1	16
Fax Machines	Ink Jet	Standard	Color & Monochrome	OM 2	17
Mailing Machines	Direct Thermal	N/A	Monochrome	OM 4	17
	EP	N/A	Monochrome	OM 4	17
	Ink Jet	N/A	Monochrome	OM 4	17
	Thermal Transfer	N/A	Monochrome	OM 4	17
Multifunction Devices (MFDs)	Direct Thermal	Large	Monochrome	OM 1	16
	Dye Sublimation	Large	Color & Monochrome	OM 1	16
	EP	Large	Color & Monochrome	OM 1	16
	Ink Jet	Standard	Color & Monochrome	OM 2	17
	Ink Jet	Large	Color & Monochrome	OM 3	17
	Solid Ink	Large	Color	OM 1	16
	Thermal Transfer	Large	Color & Monochrome	OM 1	16
Printers	Direct Thermal	Large	Monochrome	OM 8	18
	Direct Thermal	Small	Monochrome	OM 5	17
	Dye Sublimation	Large	Color & Monochrome	OM 8	18
	Dye Sublimation	Small	Color & Monochrome	OM 5	17
	EP	Large	Color & Monochrome	OM 8	18
	EP	Small	Color	OM 5	17
	Impact	Large	Color & Monochrome	OM 8	18
	Impact	Small	Color & Monochrome	OM 5	17
	Impact	Standard	Color & Monochrome	OM 6	17
	Ink Jet	Large	Color & Monochrome	OM 3	17
	Ink Jet	Small	Color & Monochrome	OM 5	17
	Ink Jet	Standard	Color & Monochrome	OM 2	17
	Solid Ink	Large	Color	OM 8	18
	Solid Ink	Small	Color	OM 5	17
	Thermal Transfer	Large	Color & Monochrome	OM 8	18
	Thermal Transfer	Small	Color & Monochrome	OM 5	17
Scanners	N/A	Large, Small & Standard	N/A	OM 7	17

3) **Energy-Efficiency Specifications for Qualifying Products**: Only those products listed in Section 2 above that meet the following criteria may qualify as ENERGY STAR. Effective dates are provided in Section 6 of this specification.

> **Note**: Imaging equipment products that make use of other products or components addressed by ENERGY STAR specifications and test procedures must use components that are capable of meeting the respective ENERGY STAR specifications in order to qualify.

Products Sold with an External Power Supply: To qualify as ENERGY STAR under the Imaging Equipment Version 1.1 Tier 2 requirements, imaging equipment products manufactured on or after July 1, 2009 using a single-voltage external ac-ac or ac-dc power supply must use an ENERGY STAR qualified supply, or one that meets the ENERGY STAR External Power Supply (EPS) Version 2.0 requirements when tested to the ENERGY STAR test method. The ENERGY STAR specification and test method for single voltage external ac-ac and ac-dc power supplies may be found at www.energystar.gov/products.

> **Note**: EPA corrected the manufacture date for imaging equipment to meet Tier 2 using an external power supply from April 1, 2009 to July 1, 2009.

Products Designated to Operate with a Type 1 DFE: To qualify as ENERGY STAR under Imaging Equipment Version 1.1 specification, an imaging equipment product manufactured on or after July 1, 2009 that is sold with a Type 1 DFE must use a DFE that meets the ENERGY STAR Imaging Equipment Digital Front End Power Supply Efficiency Requirements listed in Section 3C.

Products Designated to Operate with a Type 2 DFE: For an imaging equipment product, sold with a Type 2 DFE, manufactured on or after July 1, 2009 to qualify as ENERGY STAR under Imaging Equipment Version 1.1 specification, manufacturers should subtract the DFE's energy consumption in Ready mode for TEC products or exclude when measuring Sleep and Standby for OM products. Section 3A provides further detail on adjusting TEC values for DFEs for TEC products and Section 3B provides further detail for on excluding DFEs from OM sleep levels.

It is EPA's intent that, whenever possible, the power associated with the DFE (Type 1 or Type 2) should be excluded or subtracted from the TEC energy and OM power measurements.

Products Sold with an Additional Cordless Handset: To qualify, fax machines or MFDs with fax capability that are sold with additional cordless handsets must use an ENERGY STAR qualified handset, or one that meets the ENERGY STAR Telephony specification when tested to the ENERGY STAR test method on the date the imaging product is qualified as ENERGY STAR. The ENERGY STAR specification and test method for telephony products may be found at www.energystar.gov/products.

Duplexing: Standard-size copiers, MFDs, and printers that use EP, SI, and High Performance IJ marking technologies addressed by the TEC approach in Section 3.A. must meet the following duplexing requirements, based on monochrome product speed:

Color Copiers, MFDs, and Printers

Monochrome Product Speed	**Duplexing Requirement**
≤ 19 ipm	N/A
20 – 39 ipm	Automatic duplexing must be offered as a **standard feature** or **optional accessory** at the time of purchase.
≥ 40 ipm	Automatic duplexing is required as a **standard feature** at the time of purchase.

Monochrome Copiers, MFDs, and Printers

Monochrome Product Speed	**Duplexing Requirement**
≤ 24 ipm	N/A
25 – 44 ipm	Automatic duplexing must be offered as a **standard feature** or **optional accessory** at the time of purchase.
≥ 45 ipm	Automatic duplexing is required as a **standard feature** at the time of purchase.

Note: Based on a stakeholder comment, EPA is proposing to make explicit throughout the specification that requirements based on product speed refer to a product's monochrome product speed. This reference to monochrome product speed is included in the test procedures already and is not considered a change in the requirements, only a clarification. Stakeholders are encouraged to provide feedback on this clarification.

A. **ENERGY STAR Eligibility Criteria – TEC**. To qualify as ENERGY STAR, the TEC value obtained for imaging equipment outlined in Section 2, Table 1 above must not exceed the corresponding criteria below.

For imaging products with a functionally-integrated DFE that relies on the imaging product for its power, the power consumption of the DFE should be excluded when comparing the product's measured Sleep and standby to the combined marking-engine and functional-adder criteria limits below. The DFE must not interfere with the ability of the imaging product to enter or exit its lower-power modes. In order to take advantage of this exclusion, the DFE must meet the definition in Section 1.DD. and be a separate processing unit that is capable of initiating activity over the network.

Example: A printer's total TEC result is 24.5 kWh/week and its internal DFE consumes 50W in Ready mode. 50W x 168 hours/week = 8.4 kWh/week, which is then subtracted from the tested TEC value: 24.5 kWh/week – 8.4 kWh/week = 16.1 kWh/week. 16.1 kWh/week is then compared to the following criteria.

Note: In all of the following equations, x = Monochrome Product Speed (ipm).

TEC Table 1

Product(s): Copiers, Digital Duplicators, Fax Machines, Printers	
Size Format(s): Standard-size	
Marking Technologies: DT, Mono DS, Mono EP, Mono Stencil, Mono TT, Mono High Performance IJ	
	Tier II
Monochrome Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 15	***1.0 kWh***
15 < x ≤ 40	***(0.10 kWh/ipm)x – 0.5 kWh***
40 < x ≤ 82	***(0.35 kWh/ipm)x – 10.3 kWh***
> 82	***(0.70 kWh/ipm)x – 39.0 kWh***

TEC Table 2

Product(s): Copiers, Digital Duplicators, Fax Machines, Printers	
Size Format(s): Standard-size	
Marking Technologies: Color DS, Color Stencil, Color TT, Color EP, SI, Color High Performance IJ	
	Tier II
Monochrome Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 32	***(0.10 kWh/ipm)x + 2.8 kWh***
32 < x ≤ 58	***(0.35 kWh/ipm)x – 5.2 kWh***
> 58	***(0.70 kWh/ipm)x – 26.0 kWh***

TEC Table 3

Product(s): MFDs	
Size Format(s): Standard-size	
Marking Technologies: DT, Mono DS, Mono EP, Mono TT, Mono High Performance IJ	
	Tier II
Monochrome Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 10	***1.5 kWh***
10 < x ≤ 26	***(0.10 kWh/ipm)x + 0.5 kWh***
26 < x ≤ 68	***(0.35 kWh/ipm)x – 6.0 kWh***
> 68	***(0.70 kWh/ipm)x – 30.0 kWh***

TEC Table 4

Product(s): MFDs	
Size Format(s): Standard-size	
Marking Technologies: Color DS, Color TT, Color EP, SI, Color High Performance IJ	
	Tier II
Monochrome Product Speed (ipm)	Maximum TEC (kWh/week)
≤ 26	***(0.10 kWh/ipm)x + 3.5 kWh***
26 < x ≤ 62	***(0.35 kWh/ipm)x – 3.0 kWh***
> 62	***(0.70 kWh/ipm)x – 25.0 kWh***

Note: Based on stakeholder comments from the meeting on August 19, EPA revisited the TEC1 requirements proposed in Draft 2 to ensure that products across all the speed ranges and, specifically between 40 – 70 ipm, were well represented in the proposed requirements.

All of the TEC levels proposed in these tables represent approximately 25% of models currently available on the market in the U.S. In addition, EPA ensured that multiple manufacturers were represented under all the proposed requirements.

B. **ENERGY STAR Eligibility Criteria – OM.** To qualify as ENERGY STAR, the power consumption values for imaging equipment outlined in Section 2, Table 2 above must not exceed the corresponding criteria below. For products that meet the Sleep-mode power requirement in Ready mode, no further automatic power reductions are required to meet the Sleep criterion. Additionally, for products that meet the Standby-power requirements in Ready or Sleep mode, no further automatic power reductions are required to earn the ENERGY STAR.

For imaging products with a functionally-integrated DFE that relies on the imaging product for its power, the power consumption of the DFE should be excluded when comparing the product's measured Sleep to the combined marking-engine and functional-adder criteria limits below. The DFE must not interfere with the ability of the imaging product to enter or exit its lower-power modes. In order to take advantage of this exclusion, the DFE must meet the definition in Section 1.DD. and be a separate processing unit that is capable of initiating activity over the network.

Default Delay Time Requirements: To qualify for ENERGY STAR, OM products must meet the default-delay time settings provided in Tables A through C below for each product type, enabled upon product shipment. In addition, all OM products must be shipped with a maximum **machine** delay time not in excess of four hours, which is only adjustable by the manufacturer. This maximum machine delay time cannot be influenced by the user and typically cannot be modified without internal, invasive product manipulation. The default-delay-time settings provided in Tables A through C may be user adjustable.

Table A: Maximum Default Delay Times to Sleep for Small-format and Standard-size OM Products, Excluding Mailing Machines, in Minutes

Monochrome Product Speed (ipm)	Fax Machines	MFDs	Printers	Scanners
0 - 10	5	15	5	15
11 - 20	5	30	15	15
21 - 30	5	60	30	15
31 - 50	5	60	60	15
51 +	5	60	60	15

Table B: Maximum Default Delay Times to Sleep for Large-format OM Products, Excluding Mailing Machines, in Minutes

Monochrome Product Speed (ipm)	Copiers	MFDs	Printers	Scanners
0 - 10	30	30	30	15
11 - 20	30	30	30	15
21 - 30	30	30	30	15
31 - 50	60	60	60	15
51 +	60	60	60	15

Table C: Maximum Default Delay Times to Sleep for Mailing Machines in Minutes

Product Speed (mppm)	Mailing Machines
0 – 50	20
51 – 100	30
101 – 150	40
151 +	60

Standby Requirements: To qualify for ENERGY STAR, OM products must meet the Standby power criteria provided in Table D below for each product type.

Table D: Maximum Standby Power Levels for OM Products in Watts

Product Type	Standby (W) – Tier 2
All OM Products	1

The eligibility criteria in OM Tables 1 through 8 below address the marking engine of the product. Since products are expected to be shipped with one or more functions beyond a basic marking engine, the corresponding allowances below should be added to the marking engine criteria for Sleep. The total value for the base product with applicable "functional adders" should be used to determine eligibility. Manufacturers may apply no more than **three** Primary functional adders to each product model, but may apply as many Secondary adders as present (with Primary adders in excess of three included as Secondary adders). An example of this approach is provided below:

Example: Consider a Standard-size IJ printer with a USB 2.0 connection and a memory card connection. Assuming the USB connection is the Primary interface used during the test, the printer model would receive a functional-adder allowance of 0.5 W for USB and 0.1 for the memory card reader, for a total of 0.6 W of total functional-adder allowances. Since OM Table 2 provides a Sleep mode marking-engine criterion of 1.4 W, to determine qualification under ENERGY STAR, the manufacturer would sum the Sleep mode marking-engine criterion with the applicable functional-adder allowances to determine the maximum power consumption permitted for qualification of the base product: 1.4 W + 0.6 W. If the power consumption of the printer in Sleep mode measures at or below 2.0 W, then the printer would meet the ENERGY STAR Sleep criterion.

Qualifying Products: Table 3 – OM Functional Adders

Type	Details	Functional Adder Allowances (W)	
		Primary	Secondary
Interfaces	A. Wired < 20 MHz	0.3	0.2
	A physical data- or network-connection port present on the imaging product that is capable of a transfer rate < 20 MHz. Includes USB 1.x, IEEE488, IEEE 1284/Parallel/Centronics, RS232, and/or fax modem.		
	B. Wired ≥ 20 MHz and < 500 MHz	0.5	0.2
	A physical data- or network-connection port present on the imaging product that is capable of a transfer rate ≥ 20 MHz and < 500 MHz. Includes USB 2.x, IEEE 1394/FireWire/i.LINK, and 100Mb Ethernet.		
	C. Wired ≥ 500 MHz	1.5	0.5
	A physical data- or network-connection port present on the imaging product that is capable of a transfer rate ≥ 500 MHz. Includes 1G Ethernet.		
	D. Wireless	3.0	0.7
	A data- or network-connection interface present on the imaging product that is designed to transfer data via radio-frequency wireless means. Includes Bluetooth and 802.11.		
	E. Wired card/camera/storage	0.5	0.1
	A physical data- or network-connection port present on the imaging product that is designed to allow the connection of an external device, such as flash memory-card/smart-card readers and camera interfaces (including PictBridge).		
	G. Infrared	0.2	0.2
	A data- or network-connection interface present on the imaging product that is designed to transfer data via infrared technology. Includes IrDA.		
Other	Storage	-	0.2
	Internal storage drives present on the imaging product. Includes internal drives only (e.g., disk drives, DVD drives, Zip drives), and applies to each separate drive. This adder does not cover interfaces to external drives (e.g., SCSI) or internal memory.		
	Scanners with CCFL lamps or non-CCFL lamps	-	0.5
	The presence of a scanner that uses Cold Cathode Fluorescent Lamp (CCFL) technology or a technology other than CCFL, such as Light-Emitting Diode (LED), Halogen, Hot-Cathode Fluorescent Tube (HCFT), Xenon, or Tubular Fluorescent (TL) technologies. This adder is applied only once, regardless of the lamp size or the number of lamps/bulbs employed.		
	PC-based system (cannot print/copy/scan without use of significant PC resources)	-	-0.5
	This adder applies to imaging products that rely on an external computer for **significant** resources, such as memory and data processing, to perform basic functions commonly performed by imaging products independently, such as page rendering. This adder does not apply to products that simply use a computer as a source or destination for image data.		

Type	Details	Functional Adder Allowances (W)	
		Primary	Secondary
	Cordless handset	-	0.8
	The capability of the imaging product to communicate with a cordless handset. This adder is applied only once, regardless of the number of cordless handsets the product is designed to handle. This adder does not address the power requirements of the cordless handset itself.		
	Memory	-	1.0 W per 1 GB
	The internal capacity available in the imaging product for storing data. This adder applies to all volumes of internal memory and should be scaled accordingly. For example, a unit with 2.5 GB of memory would receive an allowance of 2.5 W while a unit with 0.5 GB would receive an allowance of 0.5 W.		
	Power-supply (PS) size, based on PS output rating (OR) **[Note: this adder ONLY applies to products which fall under OM Tables 2 and 6]**	-	For PSOR > 10 W, 0.02 x (PSOR – 10 W)
	This adder applies to only those imaging products which fall under OM Tables 2 and 6. The allowance is calculated from the internal or external power supply's **rated DC output** as specified by the power supply manufacturer. (It is **not** a measured quantity). For example, a unit that is rated to provide up to 3 A at 12 V has a PSOR of 36 W and would receive an allowance of 0.02 x (36-10) = 0.02 x 26 = 0.52 W of power supply allowance. For supplies that provide more than one voltage, the sum of power from all voltages is used unless the specifications note that there is a rated limit lower than this. For example, a supply which can supply 3A of 24 V and 1.5 A of 5 V output has a total PSOR of (3 x 24) + (1.5 x 5) = 79.5 W, and an allowance of 1.39 W.		

For the adder allowances shown in Qualifying Products Table 3 above, distinctions are made for "Primary" and "Secondary" types of adders. These designations refer to the state in which the interface is required to remain while the imaging product is in Sleep. Connections that remain active during the OM test procedure while the imaging product is in Sleep are defined as Primary, while connections that can be inactive while the imaging product is in Sleep are defined as Secondary. Most functional adders typically are Secondary types.

Manufacturers should consider only the adder types that are available on a product in its as-shipped configuration. Options available to the consumer after the product is shipped or interfaces that are present on the product's externally-powered digital front-end (DFE) should not be considered when applying allowances to the imaging product.

For products with multiple interfaces, these interfaces should be considered as unique and separate. However, interfaces that perform multiple functions should only be considered once. For example, a USB connection that operates as both 1.x and 2.x may be counted only once and given a single allowance. When a particular interface may fall under more than one interface Type according to the table, the manufacturer should choose the function that the interface is primarily designed to perform when determining the appropriate adder allowance. For example, a USB connection on the front of the imaging product that is marketed as a PictBridge or "camera interface" in product literature should be considered a Type E interface rather than a Type B interface. Similarly, a memory-card-reader slot that supports multiple formats may only be counted once. Further, a system that supports more than one type of 802.11 may count as only one wireless interface.

OM Table 1

Product(s): Copiers, MFDs	
Size Format(s): Large Format	
Marking Technologies: Color DS, Color TT, DT, Mono DS, Mono EP, Mono TT, Color EP, SI	
	Sleep (W)
Marking Engine	***30***

OM Table 2

Product(s): Fax Machines, MFDs, Printers	
Size Format(s): Standard-size	
Marking Technologies: Color IJ, Mono IJ	
	Sleep (W)
Marking Engine	***1.4***

OM Table 3

Product(s): MFDs, Printers	
Size Format(s): Large Format	
Marking Technologies: Color IJ, Mono IJ	
	Sleep (W)
Marking Engine	***15***

OM Table 4

Product(s): Mailing Machines	
Size Format(s): N/A	
Marking Technologies: DT, Mono EP, Mono IJ, Mono TT	
	Sleep (W)
Marking Engine	***7***

OM Table 5

Product(s): Printers	
Size Format(s): Small Format	
Marking Technologies: Color DS, DT, Color IJ, Color Impact, Color TT, Mono DS, Mono EP, Mono IJ, Mono Impact, Mono TT, Color EP, SI	
	Sleep (W)
Marking Engine	***9***

OM Table 6

Product(s): Printers	
Size Format(s): Standard-size	
Marking Technologies: Color Impact, Mono Impact	
	Sleep (W)
Marking Engine	***4.6***

OM Table 7

Product(s): Scanners	
Size Format(s): Large Format, Small Format, Standard-size	
Marking Technologies: N/A	
	Sleep (W)
Scanning Engine	***4.3***

OM Table 8

Product(s): Printers	
Size Format(s): Large Format	
Marking Technologies: Color DS, Color Impact, Color TT, DT, Mono DS, Mono EP, Mono Impact, Mono TT, Color EP, SI	
	Sleep (W)
Marking Engine	***14***

Note: Based on stakeholder comments from the August 19 meeting, EPA revisited the data analysis for scanner products (OM7) to incorporate the reduction of the adder for scanners that use Cold Cathode Fluorescent Lamp (CCFL) technology from 2.0W to 0.5W. The proposed Sleep requirement for OM7 products was then adjusted to permit approximately 25% of the products to qualify under ENERGY STAR.

In Draft 2, EPA asked for stakeholder input on an appropriate adder for the additional scanning function of OM1 products as compared to OM8. Based on data and comments supplied by stakeholders, EPA is proposing to increase the Sleep allowance for OM1 from 14W to 30W.

Stakeholders are encouraged to comment on these proposals.

C. **DFE Efficiency Requirements.** The following efficiency requirements are for Digital Front End equipment that is defined in Section 1.DD. of this specification.

i. Power Supply Efficiency Requirements

Type 1: DFE Using an Internal Ac-Dc Power Supply: A DFE that gets its dc power from its own internal ac-dc power source must meet the following power supply efficiency requirement: 80% minimum efficiency at 20%, 50%, and 100% of rated output and Power Factor ≥ 0.9 at 100% of rated output.

Type 1 DFE Using an External Power Supply: A DFE that gets its dc power from its own external power supply (as defined by the ENERGY STAR V2.0 Program Requirements for Single Voltage ac-ac and ac-dc External Power Supplies) must be ENERGY STAR qualified or meet the no-load and active mode efficiency levels provided in the ENERGY STAR V2.0 Program Requirements for Single Voltage ac-ac and ac-dc External Power Supplies. The ENERGY STAR specification and qualified product list can be found at: http://www.energystar.gov/ia/partners/prod_development/revisions/downloads/eps_spec_v2.pdf.

Note: Currently, the Imaging Equipment specification does not address the energy efficiency of a Type 2 DFE. Instead, partners should subtract the internal DFE energy consumption in Ready mode for TEC products. For OM Products, partner should exclude the internal DFE when measuring Sleep and Standby modes for OM products. Tier 2 of the Imaging Specification is not suggesting changing this aspect of the specification for these DFEs that get their DC power from the imaging product with which it operates.

ii. Test Procedures

Manufacturers are required to perform tests and self-certify those models that meet the ENERGY STAR guidelines.

- In performing these tests, the partner agrees to use the applicable test procedures provided in Table 4, below.

- The test results for qualifying products must be reported to EPA or the European Commission, as appropriate.

Additional testing and reporting requirements are provided below.

Models Capable of Operating at Multiple Voltage/Frequency Combinations: Manufacturers shall test their products based on the market(s) in which the models will be sold and promoted as ENERGY STAR qualified. EPA and its ENERGY STAR Country Partners have agreed upon a table with three voltage/frequency combinations for testing purposes. Please refer to the TEST CONDITIONS AND EQUIPMENT FOR ENERGY STAR IMAGING EQUIPMENT PRODUCTS for details regarding international voltage/frequency combinations for each market.

For products that are sold as ENERGY STAR in multiple international markets and, therefore, rated at multiple input voltages, the manufacturer must test at and report the required power consumption or efficiency values at all relevant voltage/frequency combinations. For example, a manufacturer that is shipping the same model to the United States and Europe must measure, meet the specification, and report test values at both 115 Volts/60 Hz and 230 Volts/50 Hz in order to qualify the model as ENERGY STAR in both markets. If a model qualifies as ENERGY STAR at only one voltage/frequency combination (e.g., 115 Volts/60 Hz), then it may only be qualified and promoted as ENERGY STAR in those regions that support the tested voltage/frequency combination (e.g., North America and Taiwan).

Table 4: Type 1 DFE Test Procedures

Specification Requirement	Test Protocol	Source
Power Supply Efficiency	Internal Power Supply (IPS)	IPS: http://efficientpowersupplies.epri.com/
	External Power Supply (EPS): ENERGY STAR Test	EPS: www.energystar.gov/powersupplies/

4) **Test Procedures**

Product Testing Set-up, Procedures, and Documentation: The specific instructions for testing the energy efficiency of imaging equipment products are outlined in three separate documents entitled:

- "ENERGY STAR Qualified Imaging Equipment Typical Electricity Consumption Test Procedure;"
- "ENERGY STAR Qualified Imaging Equipment Operational Mode Test Procedure;" and
- "Test Conditions and Equipment for ENERGY STAR Imaging Equipment Products."

The test results produced by these procedures shall be used as the primary basis for determining ENERGY STAR qualification.

Manufacturers are required to perform tests and self-certify those product models that meet the ENERGY STAR guidelines. Families of imaging equipment models that are built on the same chassis and are identical in every respect except for housing and color may be qualified through submission of test data for a single, representative model. Likewise, models that are unchanged or that differ only in finish from those sold in a previous year may remain qualified without the submission of new test data, assuming the specification remains unchanged.

If a product model is offered in the market in multiple configurations as a product "family" or series, the partner may test and report the highest configuration available in the family, rather than each and every individual model. When submitting model families, manufacturers continue to be held accountable for any efficiency claims made about their imaging products, including those not tested or

for which data was not reported.

> Example: Models A and B are identical, with the exception that model A is shipped with a wired interface > 500 MHz, and model B is shipped with a wired interface < 500 MHz. If model A is tested and meets the ENERGY STAR specification, then the partner may report the test data solely for model A, to represent both models A and B.

If a product's electrical power comes from Mains, USB, IEEE1394, Power-over-Ethernet, telephone system, or any other means or combinations of means, the net AC electrical power consumed by the product (taking into account ac-to-dc conversion losses, as specified in the OM test procedure) must be used for qualification.

Additional testing and reporting requirements are provided below.

A. Number of Units Required for Test: Testing shall be conducted by the manufacturer or its authorized representative on a single unit of a model.
    a. For products outlined in Section 2, Table 1 of this specification, if the initial unit tested has TEC test results that meet the eligibility criteria but fall within 10% of the criteria level, one additional unit of the same model must also be tested. Manufacturers shall report values for both units. To qualify as ENERGY STAR, both units must meet the ENERGY STAR specification.
    b. For products outlined in Section 2, Table 2 of this specification, if the initial unit tested has OM test results that meet the eligibility criteria but fall within 15% of the criteria level in any of the specified operating modes for that product type, then two more units shall be tested. To qualify as ENERGY STAR, all three units must meet the ENERGY STAR specification.

B. Submittal of Qualified Product Data to EPA: Partners are required to self-certify those product models that meet the ENERGY STAR guidelines and report information to EPA. The information to be reported for products shall be outlined shortly following publication of the final specification.

    In addition, partners must submit to EPA excerpts from product literature that explain to consumers the recommended default delay-times for power management settings. The intent of this requirement is to support that products are being tested as shipped and recommended for use.

C. Models Capable of Operating at Multiple Voltage/Frequency Combinations: Manufacturers shall test their products based on the market(s) in which the models will be sold and promoted as ENERGY STAR qualified. EPA and its ENERGY STAR Country Partners have agreed upon a table with three voltage/frequency combinations for testing purposes. Please refer to the Imaging Equipment **Test Conditions** for details regarding international voltage/frequency and paper sizes for each market. Products tested must operate off of the international standard nominal voltage supplies listed in the **Test Conditions**.

    For products that are sold as ENERGY STAR in multiple international markets and therefore rated at multiple input voltages, the manufacturer must test at and report the required power consumption or efficiency values at all relevant voltage/frequency combinations. For example, a manufacturer that is shipping the same model to the United States and Europe must measure, meet the specification, and report test values at both 115 Volts/60 Hz and 230 Volts/50 Hz in order to qualify the model as ENERGY STAR in both markets. If a model qualifies as ENERGY STAR at only one voltage/frequency combination (e.g., 115 Volts/60 Hz), then it may only be qualified and promoted as ENERGY STAR in those regions that support the tested voltage/frequency combination (e.g., North America and Taiwan).

5) **User Interface**: Manufacturers are strongly recommended to design products in accordance with IEEE 1621: Standard for User Interface Elements in Power Control of Electronic Devices Employed in Office/Consumer Environments. This standard was developed to make power controls more

consistent and intuitive across all electronic devices. For details on the development of this standard, see http://eetd.lbl.gov/controls.

6) **Effective Date**: The date that manufacturers may begin to qualify products as ENERGY STAR under the Version 1.1 specification, will be defined as the *effective date* of the agreement. Any previously executed agreement on the subject of ENERGY STAR qualified imaging equipment shall be terminated effective June 30, 2009.

   A. Qualifying and Labeling Products under Version 1.1: The Version 1.1 specification shall commence on July 1, 2009. All products, including models originally qualified under previous imaging equipment specifications, with a **date of manufacture** on or after the effective date, must meet the new Version 1.1 requirements in order to qualify for ENERGY STAR (including additional manufacturing runs of models originally qualified under previous specifications). The **date of manufacture** is specific to each unit and is the date (e.g., month and year) on which a unit is considered to be completely assembled.
      a. Tier 2 – Tier 2 shall commence on **July 1, 2009**.

   B. Elimination of Grandfathering: EPA will not allow grandfathering under this Version 1.1 ENERGY STAR specification. **ENERGY STAR qualification under previous Versions is not automatically granted for the life of the product model.** Therefore, any product sold, marketed, or identified by the manufacturing partner as ENERGY STAR must meet the current specification in effect at the time of manufacture of the product.

7) **Future Specification Revisions**: EPA reserves the right to change the specification should technological and/or market changes affect its usefulness to consumers, industry, or the environment. In keeping with current policy, revisions to the specification are arrived at through stakeholder discussions and would commence approximately 2 – 3 years from the effective date of Tier 2. EPA will periodically assess the market in terms of energy efficiency and new technologies. As always, stakeholders will have an opportunity to share their data, submit proposals, and voice any concerns. EPA will strive to ensure that the specification recognizes the most energy-efficient models in the marketplace and reward those manufacturers who have made efforts to further improve energy efficiency. Some of the issues to consider addressing in the next specification include:

   A. Color Testing: Based on submitted test data, future consumer preferences, and engineering advancements, EPA may modify this specification at some point in the future to include color imaging in the test method.

   B. Recovery Time: EPA will closely monitor incremental and absolute recovery times as reported by partners testing to the TEC method, as well as partner-submitted documentation regarding recommended default delay settings. EPA will consider modification of this specification to address recovery time should it become apparent that manufacturer practices are resulting in user disabling of power management modes.

   C. Addressing OM Products Under TEC: Based on submitted test data, opportunities for greater energy savings, and engineering advancements, EPA may modify this specification at some point in the future to address products that are currently treated by the OM approach under the TEC approach, including Large-format and Small-format products, as well as products that employ IJ technology.

   D. Additional Energy Impacts: EPA has received significant interest from stakeholders to consider a broader mix of energy related impacts (i.e., embodied energy, consumables, packaging) in future versions of this ENERGY STAR specification. EPA is interested in receiving stakeholder input on evaluating means of addressing this interest in a way that aligns with ENERGY STAR's guiding principles and fully expects to provide for future significant stakeholder engagement during this process.

   E. Reporting Data at 230V: EPA may consider that for those products marketed in different markets, one of which includes a 230V market, data from testing at the 230V level should be acceptable as

sufficient for the multiple markets. This suggestion is based on the observation that if a product meets the 230V specs, it will meet the standards at the lower voltage levels.

F. Expanding Duplexing Requirements: EPA may re-assess the presence of duplexing on the current range of products, and consider how the optional requirements could be made more stringent. Revisiting the duplexing requirements to result in greater coverage of duplexing would potentially result in reduced paper usage, which has been found to be the largest life cycle impact of a printer.

G. Revising TEC Test Procedure: EPA may revisit the TEC test methodology to make usage assumptions more transparent or add requirements to the specification that power consumption be measured and reported in some distinct modes that would allow for values which are relevant to actual usage patterns.