ENERGY STAR® Qualified Imaging Equipment Specification Revision
February 14, 2006 Stakeholder Meeting
Discussion Guide

Introduction

This discussion guide relays background information, comments received to date on key topics, and initial discussion questions, as appropriate, with the hope of facilitating productive discussion at the February 14, 2006, ENERGY STAR Imaging Equipment Stakeholder Meeting. EPA has received many valuable comments on the Draft 2 specification, which will ultimately contribute to the best possible final specification. EPA has included all comments received up to date on the six key topics to be discussed at the meeting in this discussion guide. Topics, with relevant comments, are presented below such that they track the order of the meeting agenda.

Product Labeling

In comments EPA has received in response to the specification, some stakeholders have requested that labeling remain wholly optional, as it is under the existing Memoranda of Understanding (MOUs) or that labeling requirements should be more flexible and allow manufacturers to choose one way to apply the label, such as application of the ENERGY STAR mark on the Web site alone. In Draft 2, EPA suggested that some form of electronic labeling could be acceptable in place of labeling the physical product. Some stakeholders have commented that this option is inappropriate for imaging equipment and would not apply to a large portion of the products addressed by the Version 1.0 specification, since many products do not have displays. Other stakeholders have requested that EPA clearly state that the physical label may be either permanent or temporary, as it is expressed in the Version 4.0 monitors specification.

EPA appreciates the feedback that stakeholders have shared regarding labeling. The following describes EPA's position on this topic, which has been modified since Draft 2:

Stakeholders must 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. The label may be permanent or temporary; and
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 will be provided in the Web-Based Tools for Partners document; and
3. Either in product literature (i.e., 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 the product packaging for products sold primarily at retail. Displaying the mark on the box for products sold in non-retail settings (e.g., in settings where the consumer is not likely to see the packaging) is optional.

Discussion Questions

- Should electronic labeling that is approved in advance on a case-by-case basis continue to be an alternative to physical product labeling even though some products are not capable of displaying such messaging?
- For physical product labeling, what types of permanent and temporary labeling would manufacturers have at their disposal?
- Do manufacturers have questions about the acceptability of any particular type of permanent or temporary label?

Product Categorization

In the Draft 2 specification, EPA attempted to group like products while maintaining sufficient distinction to address differences in the way these products consume electricity. The complexity of categorization initially proposed in Draft 1 has been simplified from eleven to four tables under the Typical Electricity Consumption (TEC) approach, and from nine to seven tables under the Operational Mode (OM) approach in Draft 2, based on such distinctions as product type, color capability, and size format. Rationale for these product groupings was provided in the Summary of Changes and Supplemental Rationale documents, which are available for review on the ENERGY STAR Web site at www.energystar.gov/productdevelopment.

Feedback that EPA has received in response to Draft 2 has highlighted the following stakeholder concerns, grouped under the applicable approach:

TEC

- Data for Serial and Parallel Color EP products do not show a visible difference in energy consumption because the TEC test procedure uses a monochrome-based test method; if EPA incorporated color into the TEC test procedure, the data would show that Parallel Color EP technology requires additional power and, thus, should be addressed separately from Serial Color for eligibility.
- Digital duplicators do not serve the same market as copiers and multifunction devices (MFDs), nor do they use high-heat technologies like these products; thus, digital duplicators should be addressed separately for ENERGY STAR eligibility.
- Language should be added to the specification to clearly state that all standard-size products using heat-based marking technologies are addressed under TEC approach, including heat-intensive Ink Jet technologies.
- Addressing copiers and MFDs together might give preference to copiers, specifically upgradeable digital copiers (UDCs) since copiers do not need to respond to electronic as well as physical inputs. Additionally, the assumed operational pattern for TEC has copiers in Auto-off mode for most of the typical week, while MFDs are in Sleep.

OM

- No Electrophotographic (EP) products should be addressed under the OM approach, specifically Large Format EP.
- Low-voltage (e.g. USB-powered) scanners should be addressed separately from other scanners since there are fundamental technology differences between these two types of products.
- Because Large Format copiers and MFDs are addressed together in the Draft 2 specification, these products both appear to be held to an Auto-off requirement, which is not suitable for MFDs. Thus, OM Table 1 should be separated into two tables.
- Ink Jet printers and MFDs should not be grouped together for consideration under the OM approach since these products have different functional adders applied.
- Products designed to be operated solely by battery should be clearly included in the definitions and Eligibility Criteria.

Discussion Question

- Based on the limited dataset for Large-format copiers and MFDs, the size of this market and operational similarities between these two products, EPA supports its decision to group these products for consideration under OM Table 1. However, do stakeholders feel that the ENERGY STAR qualified products database is missing data for any particular speed segments that should be supplemented prior to analysis?

Duplexing Requirements

Specific duplexing requirements were introduced to the specification in Draft 2, specifying that Standard-size EP products of certain speeds must have duplexing capability either as an optional accessory or as a standard capability offered at the time of shipment. The duplexing requirements, which are applicable for Standard-size EP copiers, printers, and MFDs, are based on product speed and product type.

Manufacturers have expressed differing concerns as well as suggested alternative approaches regarding these requirements, which are highlighted in the applicable category below:

General Comments

- Soon it will be typical for consumer-designed MFDs to have speeds between 20 and 30 ipm; however, consumers do not typically request duplexing on their products.
- Only 7% of all MFDs sold in the US market in 2005 were sold with the capability to duplex. Duplexing capability for a typical MFD requires a marked increase in the volume of product parts, product weight, and product cost, which would waste more rather than save resources.
- Manufacturers will have difficulty meeting the ENERGY STAR labeling requirements in Draft 2 with the proposed duplexing requirements since many models are sold in configurations with and without duplexing capability. This would mean some models qualify and others do not, although they might share the same product literature, packaging, etc.
- Most standard-size copiers and MFDs that print 45 ipm and above come equipped with duplexers as standard.

Alternative Proposals

- Because copiers, MFDs, monochrome and color printers generally use the same marking engines, these products should be held to the same duplexing requirements.
- Speed should be replaced by specific intent (business vs. consumer) and design for determining duplexing requirements.
- EPA should consider basing duplexing requirements on the number of users the product is intended to serve, since business users more often request duplexing capability than individual consumers.
- Duplexing requirements should address monochrome printers and MFDs in one grouping and color printers and MFDs in a second grouping, using the Draft 2 proposed requirements for printers.
- Duplexing requirements should apply to copiers, MFDs, and printers as a single group, and use the requirements outlined in the existing copier and MFD MOUs, where it is required to be an option for products 21 – 44 ipm and standard for 45 ipm and above.
- EPA should consider allowing a "Duplex Unit Only" message alongside the ENERGY STAR mark to indicate that only variations of a model with duplexing capability earn the ENERGY STAR in the instance described above.
- Duplexing requirements should not be limited to EP products, but rather should apply to all products which use a large amount of paper.
- The speed thresholds for requiring duplexing as optional and standard for monochrome printers and MFDs would make more sense at 30 ipm and 65 ipm, respectively. For color printers and MFDs, the optional thresholds should be 15 ipm for color printers and 20 ipm for color MFDs, whereas the standard thresholds should be 50 ipm for both.

Discussion Questions

- If duplexing requirements for printers, copiers, and MFDs were addressed in a single table with the same speed thresholds applied to all three products, would requiring that duplexing be optional from 21 ipm to 44 ipm and standard from 45 ipm and above be feasible for all three product types?
- Should duplexing requirements be applied to all TEC products, rather than just those using EP technology?

Typical Electricity Consumption (TEC) Eligibility Criteria

Draft 2 Specification Levels

In the Draft 2 specification, EPA proposed specific eligibility criteria levels for TEC Tables 1 through 4. A Supplemental Rationale document explaining how these criteria were developed was made available to stakeholders in January.

Stakeholder concerns regarding these criteria are highlighted below:

- To earn a lower TEC value, manufacturers might shorten the default-delay time to Sleep, or reduce the power used during Ready and/or Sleep, which could negatively affect responsiveness, since a large portion of a product's TEC is comprised of Ready energy. To avoid this possibility, EPA should consider basing the specification level solely on active imaging, which makes tampering less likely.
- The "elbow" at 55 ipm seems to be based primarily on MFD and copier data, not on data from any of the other categories, which may not be appropriate.
- On page 1 of the Supplemental Rationale, EPA includes an assertion that copiers use more energy than MFDs, which is clearly not the case in Figure 1 where the copier data are visibly lower than the MFD data.
- The formulas used in TEC Tables 1 through 4 should include the variable "x" to represent product speed, as it is presented in the Supplemental Rationale, to reduce confusion.

Estimating/Measuring Internally-integrated Digital Front-end (DFE) Energy Consumption

EPA recognizes that imaging products with more computational and storage capability require extra power. Due to the architecture of most current computers and network interfaces, these systems cannot go to the lower-power sleep states that other parts of imaging products can, and therefore can contribute significantly to TEC consumption.

For external DFEs with a separate power cord, the DFE power can be excluded from the energy measurement. However, for internal DFEs, or for extra powerful print controllers, there is no such easy solution. EPA proposed in Draft 2 that manufacturers may subtract the energy consumed by the physically- and functionally-integrated DFE from the imaging product's total TEC prior to considering the eligibility of the imaging product against TEC Tables 1 through 4. Since a fine line distinguishes a "standard" print controller from a more powerful physically- and functionally-integrated DFE, EPA wants to ensure that this subtraction is only applied to products where the additional energy-usage is warranted. A definition of what functionalities must be offered in order to warrant this energy might be one way to classify these products. Stakeholder comments related to this topic are provided below:

- An external or embedded DFE and a personal computer share the same typical characteristics with regards to power consumption, processor clock speed, and memory.
- A physically- and functionally-integrated DFE provides the following functions that distinguish it from an average print controller: network connectivity in various environments; mailbox functionality; queue management; and machine management.

Discussion Questions

- What minimum functionality should be offered by a physically- and functionally-integrated DFE to classify it as "beyond the normal/minimum"?
- To aid in the consideration of this issue under the OM approach, are DFEs typically external for Large-format products?

Operational Mode (OM) Eligibility Criteria

Functional Adders

In the Draft 2 specification for imaging equipment, EPA proposed a list of twelve categories for which a functional-adder allowance could be provided to products. For the data-connection categories and for fax functionality, EPA provided two different allowances dependant on whether the functional adder was the primary active interface or function used during the OM test procedure. If the interface or function was active during the test procedure, and therefore considered "primary," a higher allowance was provided.

As noted in the Draft 2 specification, the functional adders and corresponding allowances provided were derived primarily from the European Code of Conduct (CoC) and stakeholder feedback. The CoC process derived functional-adder values for a variety of interfaces and other functions through discussions among industry and the public sector, in the context of set-top-boxes. Background behind each functional-adder allowance proposed in Draft 2 follows:

A. Wired interfaces < 20 MHz
Proposed Allowance: 0.3 W (primary); 0.2 W (secondary)
The CoC allowances for 100 Mbit/s Ethernet (considerably faster than this category) and for USB (i.e., USB 1.x) are 0.4 W and 0.3 W, respectively. Older protocols, such as IEEE 488 and RS232, have even less processing overhead than Ethernet or USB and, thus, are expected to require less power. Since EPA also received stakeholder feedback proposing 0.3 W, this allowance seemed to be the obvious choice for this category.

B. Wired Interfaces < 500 MHz
Proposed Allowance: 0.5 W (primary); 0.2 W (secondary)
The CoC allowance for IEEE 1394 is 0.8 W, but since CoC targets data-intensive set-top boxes, this was assumed to be 1394b, which operates at 800 MHz. The interface types provided as examples in Draft 2 (e.g., USB 2.x) are generally mature technologies and can be implemented with power-efficient components. Some, such as USB 2.x, support low-power modes and others are likely to do so in the future. This category extends well above the 100 Mbit Ethernet speed, for which CoC provides 0.4 W, and so the higher figure of 0.5 W was selected.

C. Wired Interfaces > 500 MHz
Proposed Allowance: 1.5 W (primary); 0.5 W (secondary)
Measurements of NIC power at 100 Mbit/s and 1 Gbit/s on PCs as well as datasheets for Ethernet-controller components suggest a 1 W premium for 1G operation over 100 Mbit when active. While the difference with the interface at very low levels of data traffic should be smaller, in Draft 2, EPA provided the full 1 W of increment over the 100 Mbit allowance. NICs are available today that power down to lower speeds and lower-power consumption when the product is in Sleep so that a significant drop in power is achievable.

D. Wireless Interfaces
Proposed Allowance: 0.7 W (secondary)
The primary driver behind wireless protocols and interfaces is support of portable, battery-powered devices. As such, these need to be particularly power-efficient, and support low power modes when little or no data needs to be transmitted. EPA is not aware of any imaging products that lack wired interfaces completely, and anticipates that manufacturers would typically use a wired interface as the primary interface during testing, leaving wireless as secondary. However, in the absence of certain data, EPA provided more power in Draft 2 for these interfaces than the fastest wired interfaces are known to need.

E. Memory Card and Similar Interfaces

Proposed Allowance: 0.1 W (secondary)

Since the imaging equipment OM test procedure does not call for the presence of a card or camera, these interfaces are expected to require minimal power while the imaging product is in Sleep.

F. Fax

Proposed Allowance: 0.4 W (primary); 0.2 W (secondary)

One stakeholder proposed 0.4 W for fax capability, which EPA assumed was intended for units using the fax function during the test procedure, so this value was selected for the Primary functional adder. When the fax line is not in use, as is the case when this adder is considered Secondary, more of the circuitry could be powered-down, so the allowance was consequently reduced.

G. Infrared

Proposed Allowance: 0.25 W (secondary)

Arguably, infrared is a type of wireless interface, but EPA considered the characteristic sufficiently different to warrant a separate category in Draft 2. This allowance is taken directly from the CoC specification.

Storage

Proposed Allowance: 0.2 W (secondary)

An imaging product, while in Sleep, can spin down any disk drives and power down most of its controller circuitry, thus requiring a minimal amount of power for storage, as proposed in Draft 2. Computers represent a good example of products with disks that can spin and power down as needed. As more battery-powered devices have disk storage, there should be greater availability of drives and controller hardware that have very low consumption while not in use.

Scanners with CCFL Lamps

Proposed Allowance: 2.0 W (secondary)

EPA proposed 2.0 W for this functional adder based on stakeholder support for 2.5 W. The reduction was intended to avoid too high of a functional adder, considering its effect on the base unit level, and as an expectation of improved technology in future products.

Scanners with non-CCFL lamps

Proposed Allowance: 0.5 W (secondary)

EPA proposed 0.5 W for this functional adder per a stakeholder proposal. At a minimum, addition of scanning functionality will increase the size and complexity of the power supply so that some allowance is merited.

Enhanced Displays

Proposed Allowance: 0.5 W (secondary)

EPA proposed 0.5 W for this functional adder, constituting a modest reduction to stakeholder suggestions. The reduction was intended to avoid too high of a functional adder (with its effect on the base unit level) and an expectation of improved technology in future products, particularly as more mobile products include highly efficient enhanced displays.

PC-based System

Proposed Allowance: -0.5 W (secondary)

EPA proposed this functional adder directly per a stakeholder proposal, as imaging products reliant on a PC for most functionality do not require the same level of power as required by stand-alone products. PC-based imaging products typically have smaller processors, less memory, less user-interface hardware, etc.

Proposed functional adders for which no allowance was included

Not all functional adders proposed by stakeholders were included in the Draft 2 specification. For those that were not included, it was assumed that very little or no consumption should be needed for the function while the product is in Sleep. Examples include paper-processing functions (e.g., additional paper feeders, auto-duplexers, and finishing devices) as well as extra colors beyond the typical four for color products.

Over the past few weeks, EPA has compiled a dataset of existing ENERGY STAR qualified product data (including non-qualified data submitted by manufacturers during this revision process) populated with the functional adders offered "as standard" on each manufacturer's Web site or product literature. EPA has begun analyzing this dataset to determine the "base" marking-engine value in Sleep using the functional adders and their corresponding allowances, as provided in Draft 2. Once this analysis is complete, EPA will have a populated dataset of marking-engine Sleep power values, which will be used in determining the top 25% ENERGY STAR criteria for each of the seven OM tables.

Although stakeholders suggested a range of possible values for the various functional-adder allowances proposed in Draft 2, only a few of these suggestions were accompanied by supporting documentation. Examples of documentation included measurements of two systems that differed only in the presence or absence of a function, or a data sheet for a component or subsystem. Initial analysis findings show that some of the more energy-intensive allowances suggested by stakeholders may be much higher than what these functions are actually consuming while a product is in Sleep. EPA needs supporting documentation to aid consideration of functional-adder suggestions from stakeholders.

As an example: in Sleep, a manufacturer-reported 16-ipm standard-size Ink Jet printer is reported to consume 1 watt. The manufacturer's Web site states that this product is shipped with Bluetooth and USB capability. Using some of the allowance suggestions from stakeholders, these two functions alone could consume as much as 6 watts while the imaging product is in Sleep, whereas the product itself consumes only 1 watt.

EPA received thorough comments from stakeholders in response to the functional adders and their corresponding allowances in Draft 2. These very detailed comments have been summarized as much as possible below:

Functional Adder Types

- Allowances should be provided for additional ink colors.
- An allowance should be provided for each 256 MB of RAM.
- Under fax capability, separate allowances should be provided for cordless handset functionality and incoming-fax ring-tone-cancellation functionality.
- An allowance should be provided for memory-card read/write functionality.
- An allowance should be provided for status-monitor functionality.
- EPA should clarify how physically- and functionally-integrated DFEs should be treated under the OM approach.
- An allowance should be provided for product heaters.
- EPA should clarify whether the enhanced-display allowance includes monochrome LCD displays or only color.
- An allowance should be provided for power supply size, since units that require more power at peak consumption (i.e., Active mode) have a larger power supply, which will have a larger no/low-load loss than a smaller supply. This allowance would help account for greater Sleep-power needs of more complex products. As an example, a 3% allowance could be added based on the power-supply output-power rating, up to 10 W while in Sleep, resulting in an additional (50 W – 10 W) * 3% = 1.2 W for a product whose output-power rating is 50 W.

Adder Allowances

- The functional-adder allowances provided are inadequate for the functions they represent.

- More power should be allowed for more complex devices.
- 0.2 – 0.4 watts is provided as an allowance for fax capability in Draft 2, but FEMP rules allow 2 watts for this same capability while the product is in Standby.
- EPA should provide a range of power for each adder type, from minimal power needed to nominal power needed, using the minimum power allowance to perform the analysis determining the marking-engine criteria, with the nominal level used in the specification for the added allowance.
- EPA should consider abandoning the functional-adder concept if more realistic numbers are not provided.

Standby

EPA has received concerns from stakeholders regarding the Standby power requirements proposed in Draft 2 for OM products. As noted in earlier correspondence, one of EPA's goals is to harmonize its ENERGY STAR Standby levels with Federal Energy Management Program (FEMP) levels as much as possible. Early in the ENERGY STAR imaging equipment specification-revision process, FEMP representatives indicated to EPA that providing Standby requirements for products addressed by the TEC method would be unnecessary, since the TEC method considers the energy consumption of imaging products in all modes of operation. **As a result, EPA has developed Standby-level requirements only for products addressed by the OM approach.** EPA agrees with their counterparts in the European Commission (EC), who have suggested that Standby is a key power state to target in imaging equipment.

Comments highlighting stakeholders concerns on this topic are presented below:
- Very few products on the market today can reach 1 watt while in Standby and would require redesign to meet this requirement. Combined with the fact that many products using external power adapters would not meet the EPS Tier II requirement, this would result in very few products qualifying for ENERGY STAR in 2007.
- FEMP requires that fax machines consume less than or equal to 2 watts in Standby while the Draft 2 ENERGY STAR specification requires 1 watt for this same power state.
- EPA should clarify if Standby should be measured with all systems switched off by means of a mains switch, when available, but with the power cord of the imaging product still plugged into the mains.
- EPA should clarify how a DFE should be treated under the OM approach with regards to Standby mode.
- Networked printers and MFDs will never enter an Off state in practice, thus making a Standby requirement for these products superfluous.
- Fax-machine manufacturers either should be allowed additional time to meet the 1-watt Standby criterion by way of a tiered approach to the fax-machine requirements, or given a Standby functional-adder allowance for fax capability.

Default Delay Times

EPA has considered data for existing qualified ENERGY STAR OM products as well as feedback from stakeholders in determining the appropriate default-delay-time requirements for the Version 1.0 specification. Because OM Tables 1 through 4 assume a functional-adder approach and are not based on speed, the application of default-delay-time requirements will need to be handled separately from the OM eligibility criteria tables, similar to the way duplexing requirements were applied in Draft 2.

EPA is considering the following requirements for all products addressed by the OM approach. Tables 1 and 2 below were developed based on the existing default-delay requirements currently provided in the MOUs for copiers, faxes, MFDs, printers, and scanners, with a few adjustments. As first mentioned in the ENERGY STAR Imaging Equipment Directional Draft, EPA considers 60 minutes as ample delay time for a product to enter its lower power modes, and therefore, this time allowance has replaced previously allowed periods of 90 and 120 minutes.

Table 1: Maximum Default Delay Times to Sleep for Small-format, Standard-size, and Continuous Form OM Products in Minutes

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 2: Maximum Default Delay Times to Sleep for Large-format OM Products in Minutes

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	30	30	30	15
51 +	60	60	60	15

Discussion Questions

- Do functional adders make sense for consideration in Standby mode?
- Do stakeholders see a need for a recovery-time requirement in conjunction with the default-time requirements provided in Tables 1 and 2 above?

Process for Partnership and Product Qualification

It is important to note that the ENERGY STAR Version 1.0 specification for imaging equipment will not be fully finalized until EPA's counterparts in the European Commission (EC) review and approve the specification. EPA will keep stakeholders informed during this process. EPA is pleased that representatives from the EC will be present at the February 14th stakeholder meeting; EPA welcomes any comments they might have on this expected process. Pending EC acceptance of the Version 1.0 specification, current and new ENERGY STAR partners will be encouraged to sign the ENERGY STAR Partnership Agreement in advance of the scheduled effective date. The new specification will go into effect first for Digital Duplicator manufacturers, who will be able to join as ENERGY STAR Imaging Equipment partners as soon as the specification is officially finalized. Once they have signed a Partnership Agreement, they will be able to submit digital-duplicator product data to EPA for review and qualification. These partners and qualified products will then be listed on the ENERGY STAR Web site at www.energystar.gov/products.

For all other imaging equipment products, including copiers, fax machines, MFDs, mailing machines, printers, and scanners, the scheduled effective date is March 1, 2007. Companies will be encouraged to join the ENERGY STAR program and submit qualifying product data prior to this date, but it is not until this date that EPA will begin promoting these partners and their products under the new Version 1.0.

To prepare for the effective date of the Version 1.0 imaging equipment specification on March 1, 2007, EPA will provide an ENERGY STAR Online Product Submittal (OPS) application to partners in advance so that they may begin submitting qualified product data to EPA for review and qualification. The existing OPS application will be revised in early January 2007 to begin collecting Version 1.0 data. Allowing the submission of Version 1.0 data two months prior to the

specification's effective date will help EPA ensure that the qualified product list available on March 1, 2007 is a ready reference for consumers. Due to this change in OPS, in early January, partners must cease reporting new data to EPA for products that meet only the specifications in the existing MOUs. Partners may continue to refer to such products as ENERGY STAR qualified through February 28, 2007; however, EPA will not be promoting these products on the ENERGY STAR Web site. Products qualified and listed prior to January 2007 will remain listed on the ENERGY STAR Web site through February 28, 2007.

Discussion Questions

- Would manufacturers be interested in participating in the development of the OPS system for imaging equipment (this might include advanced review of data fields for collection and beta-testing the collection system)?
- Will resetting the database in January cause any inconvenience to manufacturers as they continue qualifying products under the MOUs?

Next Steps and Timeline

While EPA intends to complete the ENERGY STAR Version 1.0 imaging equipment specification in March 2006 as planned, the originally-proposed March 1st date may be overly optimistic. Outstanding questions remain on key components of the specification, such as the OM functional-adder approach and the requirements for duplexing. Following the finalization of the specification in March, EPA recognizes that the TEC and OM test procedures will need slight adjustments to ensure that they are consistent with the specification. Thus, following is a tentative timeline:

- Industry stakeholder meeting – February 14
- EPA distributes Draft 2 comment response summary – February 24
- EPA shares OM Functional-adder analysis and Draft OM Marking Engine Criteria – March 1
- Comment deadline for OM Marking Engine Criteria – March 22
- Version 1.0 specification finalized, pending acceptance by the EC – Late March
- Digital Duplicator manufacturers may join ENERGY STAR under Version 1.0 and submit qualified product data to EPA, pending Version 1.0 acceptance by the EC – April 2006
- ENERGY STAR Online Product Submittal (OPS) system stops accepting qualified product data under existing MOUs, pending Version 1.0 acceptance by the EC – Early January 2007
- Copier, MFD, mailing-machine, fax-machine, printer, and scanner manufacturers may sign the Partnership Agreement and begin submitting qualified product data under Version 1.0, pending acceptance by the EC – Early January 2007
- Version 1.0 specification effective date, pending acceptance by the EC – March 2007
- Partners must cease referring to products qualified under the MOUs as ENERGY STAR qualified, pending Version 1.0 acceptance by the EC – March 2007
- Imaging Equipment partners and products qualified under Version 1.0 displayed on the ENERGY STAR Web site, pending Version 1.0 acceptance by the EC – March 2007