Green Purchasing Best Practices: Imaging Equipment

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Green Purchasing Best Practices: Imaging Equipment

HIGHLIGHTS
- "Imaging Equipment" includes office copiers, printers and multi-function devices (MFDs).
- In October 2012, IEEE adopted a new **standard for imaging equipment** and incorporated it into the Electronic Products Environmental Assessment Tool (EPEAT). Purchasers may now simply specify EPEAT-compliant products. A registry of compliant products is available **here**.
- Purchasers can add environmental specifications to commodity contracts and leasing agreements as well as contracts for managed print services.
- Green consumables such as recycled paper, and remanufactured and high-yield toner and ink cartridges, as well as green designs such as automatic duplexing systems, sleep and standby modes, and toner reduction settings, increase environmental and economic benefits.

WHY BUY GREEN IMAGING EQUIPMENT? (Page 1)
Environmental and Health Benefits (Page 1)
- EPEAT-registered imaging equipment complies with the European Union's Restriction of Hazardous Substances (RoHS) Directive, limits toxic chemical emissions from imaging equipment and meets the ENERGY STAR standard, saving energy, especially when in standby and sleep modes.
- Efficiently designed imaging equipment conserves natural resources by easily making two-sided copies, reducing toner and ink use, using recycled paper without jamming, containing recycled materials, and facilitating remanufacturing and recycling at the end of its useful life

Economic Benefits (Page 2)
- Purchasing MFDs, networking the equipment, and eliminating individual desktop printers is much less expensive than buying separate imaging devices, while also conserving energy, saving space, and lowering equipment recycling and disposal costs.
- ENERGY STAR-rated imaging equipment saves money by lowering electricity use. It may also be required in some situations, such as LEED-certified buildings.
- Auto-duplexing printers and copiers can reduce paper consumption up to 40%.
- Choosing imaging equipment that is compatible with remanufactured toner and ink cartridges can significantly lower its per-page operating costs.

BEFORE BIDDING… (Page 4)
Which Products Are Needed?
- Match expected volume with appropriately sized machines. Avoid buying "too much machine."
- Should your imaging equipment use toner or ink? Color or black and white copies?
- Will compact, networked MFDs fulfill the need? Should the MFDs be copier-based or printer-based?
- Calculate prices based on lifecycle costs, including initial price as well as energy, ink/toner, paper use, and other costs. Figure the total cost of ownership times each year, per agency depreciation schedule.
- Whether buying or leasing imaging equipment, require maintenance service contractors to support your environmental criteria, including the use of recycled paper and remanufactured cartridges.

What Green Products Are Out There? (Page 4)
- **EPEAT**-registered imaging equipment is listed on the EPEAT registry. Products will indicate a bronze, silver or gold rating.
- Request demonstrations of EPEAT-registered imaging equipment available from local vendors.
- Research environmental features and equipment options on the independent **Buyers Laboratory** (BLI) website for free or low cost.
- **Massachusetts** and **California** both have model contracts for green imaging equipment.

Are There Useful Cooperative Purchasing Contracts? (Page 4)
- WSCA contract for **Copiers (Multifunction)** & Related Software (NV-2009) features MFDs that are ENERGY STAR-rated, have duplexing capability, and meet chemical content and emissions standards.
- WSCA **Digital Print & Quick Copy Contract** (UT-2011) offers full service (managed print) contracts with three vendors. Users can request print jobs that are double-sided and on recycled paper.

GREEN CERTIFICATIONS AND STANDARDS FOR IMAGING EQUIPMENT (Page 8)
- The comprehensive Electronic Products Environmental Assessment Tool (EPEAT) for Imaging Equipment uses a new multi-attribute standard (IEEE 1680.2) along with a **registry** of manufacturer-identified products, to rate environmentally preferable imaging equipment. It incorporates several other environmental standards and certifications, including ENERGY STAR and the European Union's RoHS Directive, which limits heavy metals and brominated flame retardants.

BID SPECIFICATIONS (**Page 10**)

While WSCA and States such as CA and MA have developed contracts for green imaging equipment, the new EPEAT multi-attribute imaging equipment standard and registry make specifying much easier.

Minimum Requirements (Specifications) (Page 10)

- Equipment shall be **EPEAT**-registered, minimum bronze level.
  (Isolated exceptions should be listed and require ENERGY STAR rating.)
- Equipment shall include automatic duplexing and be shipped with duplex mode set to "on" by default.
- Equipment shall be shipped with energy management systems for sleep/standby modes enabled.
- Vendors shall guarantee that equipment (including duplexing) works reliably with recycled paper and remanufactured toner/ink cartridges.
- Vendors shall provide annual reports on EPEAT-registered products sold under this contract.

Additional Desirable Sustainability Attributes (Page 10)

- Purchasers can give extra credit to products with EPEAT Silver- or Gold-level registration or that meet individual EPEAT optional criteria, as well as to products offered in easily recyclable or certified commercially compostable (e.g., by BPI) packaging.

ONCE THE BIDS ARE IN… (**Page 12**)

- Verify that products are on the EPEAT registry, and any additional environmental claims.
- If a product category has insufficient EPEAT-registry competition, verify ENERGY STAR ratings and compare environmental claims, using the EPEAT attribute categories for guidance. (See **Appendix A**)
- You may need to make multiple awards to access the range of products and brands desired. The bid evaluation process may require a specified time period for demonstration and performance testing.

Assessing Best Value (Page 12)

- The lifetime cost of the consumables, such as toner or ink, can eclipse the initial equipment cost.
- Remanufactured toner cartridge options can reduce consumables' costs and environmental impacts.
- If comparing a machine that easily duplexes to one that does not, add the cost of paper to the lifecycle cost calculation, since duplexing can significantly lower its total cost of ownership (TCO).
- Use information from vendors, Buyers Laboratory, manufacturers' websites, or internal spreadsheets to compare equivalent machines based on initial cost, electricity, duplexing savings, consumables, networking and user support, service costs, and cost of recycling at end-of-life.

VENDOR EVALUATION (Page 14)

- Assess best vendor value and consider awarding extra points for offering environmentally preferable packaging and delivery systems, electronic waste collection and recycling services, and training and technical assistance services. See vendor evaluation form for this product category in **Appendix B**.

MAXIMIZE GREEN IMPACT (Page 15)

- Consider having a pre-bid meeting to explain your green specifications to potential bidders.
- Publicize the availability of EPEAT-rated imaging equipment to state agencies, local governments and other potential contract users. Highlight environmental and financial benefits of using MFDs.
- Plan for equipment placement in well-ventilated locations to reduce staff exposure to volatile organic compounds (VOCs), particulate dust, and other toxic emissions.
- Be sure equipment is set up to automatically power down to standby or sleep mode when not in use.
- Use remanufactured, high-yield, or certified biobased toner and ink cartridges, whenever practicable.
- Educate users on how to use environmental functions of the imaging equipment such as power management, duplexing, scanning and emailing functions as well as draft settings.
- Adopt a green electronics policy guiding the procurement, use and recycling of imaging equipment.
- Join the **State Electronics Challenge** (SEC) to (1) purchase greener electronic products; (2) reduce impacts of electronic products during use; and (3) manage obsolete electronics.
- If contracting for copying or printing services, include environmental criteria in the specifications and evaluation of potential vendors.

WHAT'S ON THE HORIZON? (Page 16)

- As the number of products available in the EPEAT registry grows, consider changing the minimum specification to require products to meet EPEAT Silver or Gold levels.

WHY BUY GREEN IMAGING EQUIPMENT?

What is Green Imaging Equipment?

"Imaging Equipment" includes office copiers, printers and multi-function devices (MFDs), which combine both copying and printing into one machine, usually along with scanning and faxing as well.

To buy greener imaging equipment, look for products with verifiable environmental attributes, including those that are relatively energy-efficient during use and power-down when left idle, that can automatically print on both sides of the paper, that have relatively low emissions of toxic air pollutants, that are manufactured with recycled-content and low-toxicity materials, that can reliably handle recycled paper and remanufactured toner cartridges, and that can be easily recycled at the end of the equipment's useful life.

In October 2012, EPEAT finalized a new standard for imaging equipment, and followed up with a new **registry** of compliant products in early 2013. Consequently, purchasing environmentally preferable imaging equipment has become much easier because EPEAT-compliant products can simply be specified.

Environmental specifications can be added to both commodity contracts and leasing agreements. Copiers and printers may be found on separate contracts. MFDs may be included on either one, particularly because similar MFDs may be purchased with either a copier base or a printer base, which result in some differences. Some jurisdictions prefer to own the machines, while others lease them. If you contract with vendors to provide some outside services, such as copying, require that they also meet your environmental criteria.

What Are the Benefits of Using Green Imaging Equipment?

Carefully chosen imaging equipment can easily meet offices' varying needs for copying and printing as well as significantly reduce environmental impacts, offering an opportunity for saving money through green purchasing.

Environmental and Health Benefits

Using green imaging equipment saves energy.
According to the U.S. federal government's ENERGY STAR Program, "today, there are over 170 million imaging equipment units in U.S. buildings. Together, these units consume 30 billion kWh each year, which is more than one percent of the U.S. building sector electricity consumption."[1]

Imaging equipment uses electricity when in use, although less when in standby and sleep modes. ENERGY STAR-qualified[2] imaging equipment reduces the amount of energy required in all three

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[1] ENERGY STAR Program, "Imaging Equipment for Consumers," website accessed on November 30, 2012; http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=IEQ

[2] This includes products registered using the Electronic Products Environmental Assessment Tool (EPEAT).

modes. By doing so, it lowers the cost of using this equipment and can reduce the environmental impacts (including potential climate effects) associated with generating the electricity, depending on the method of power production.

Green imaging equipment contains less toxic chemicals and reduces emissions.
Hazardous substances in electronic equipment can include cadmium, mercury, lead, hexavalent chromium, polybrominated biphenyls (PBBs), and polybrominated diphenyl ethers (PBDEs). PBBs and PBDEs are two classes of highly persistent, bio-accumulative, and toxic (PBT) chemicals that are commonly added to plastics to reduce flammability.

Imaging equipment emits chemicals and particulate dust into the surrounding air, both from the materials (such as plastics) from which it is constructed as well as from toner that is heated in order to become fused onto the paper. As a result, all printing and copying machines can impact the quality of indoor air that people are breathing every day, although some more than others.

Green imaging equipment includes compatibility with sustainable consumables.
Imaging equipment should be compatible with the use of recycled paper as well as high-yield and remanufactured ink and toner cartridges. (Be sure that remanufactured toner cartridges have replaced parts and components when necessary, not only new toner.) Colored ink and toner containers should be designed efficiently, such as using independent color modules rather than combining all the colors into one unit that must be replaced when only one color runs out.

Green imaging equipment conserves resources through green design.
Environmentally preferable imaging equipment is designed to default to duplexing, automatically shift to lower power (sleep and standby modes) when unused for specified times, feature a toner- or ink-reducing mode that decreases coverage on the paper during draft printing, and incorporate instant- or quick-fusing technology to save energy by rapidly setting the toner.

Some parts can be made with recycled content, and plastic parts and casing can be made from biobased plastic, which is derived from plants (a renewable resource) rather than petroleum (a non-renewable resource).

Green imaging equipment reduces solid waste through proper end-of-life management.
Machines can be refurbished, remanufactured, or recycled at the end or their useful life. Equipment should be designed for recyclability, including easy disassembly. Operational equipment that is in good working condition but is no longer needed can be donated or sold at auction.

Imaging equipment will need to be removed and recycled or safely disposed of at the end of its useful life. This service can be included in your contract by giving preference to vendors offering to collect and recycle used imaging equipment.

Consumables will also need end-of-life management. For example, ink and toner cartridges should be returned for refilling, recycling, or remanufacturing.

Economic Benefits

Green imaging equipment saves energy.

Lower electricity usage when imaging machines are operating, particularly when they are in sleep and standby modes, significantly reduces energy costs. According to the U.S. ENERGY STAR Program, "models that meet the most recent ENERGY STAR requirements are 40% more energy efficient, and feature efficient designs that help equipment run cooler and last longer."

Green imaging equipment costs less.

In the past, offices bought copiers, printers, scanners, and fax machines separately, resulting in significant cumulative costs. Today, offices have the opportunity to get all these functions in one piece of equipment, which is much less costly than buying separate technologies.

Green imaging equipment has a smaller ecological footprint.

When each type of imaging equipment is bought separately, the space needed to site and operate them is also considerable. Combining copying, printing, scanning and faxing into one compact machine allows it to be sited in a small fraction of the space otherwise needed for multiple machines. Networking the machines enables many workers to access one printer/copier rather than having individual low-use machines, and offers the possibility of eliminating most, or all, desktop printers.

Green imaging equipment offers more efficiency.

Many MFDs have user-friendly built-in scanning and faxing capabilities, which encourage reduced printing and copying, providing further savings on the costs of paper and ink/toner.

Green imaging equipment offers more functionality.

Many MFDs offer optional faxing capabilities, allowing an office that may not use faxing frequently to consolidate it into only one machine, or forego it completely if appropriate, thereby providing further savings.

WHAT PRODUCTS ARE OUT THERE? MARKET ASSESSMENT

What Types of Green Imaging Equipment Are Readily Available?

In addition to demonstrations by local vendors, purchasers can research potential imaging equipment options on the **Buyers Laboratory** (BLI) website. BLI provides a wealth of information based on their testing, including detailed descriptions of individual machines, environmental reports, purchasing advice, and much more. While a substantial amount of BLI's information is free, some is available by subscription only. BLI's environmental reports detail energy consumption, productivity (including duplex mode), warm-up time, noise, and use of recycled paper.

In addition, BLI reports comparable prices for the machines (although contract pricing is likely to be lower), and provides a **web-based tool** to evaluate the real total cost of ownership (TCO), to help users compare machines and specifications.

Are There Useful Cooperative Purchasing Contracts?

The Western States Contracting Alliance (WSCA) provides a contract for **Copiers (Multifunction) & Related Software** (WSCA-NV) w24-2009 that features several different vendors and a variety of equipment types. All products offered on **this contract** must be MFDs and meet a broad array of environmental specifications, according to the RFP for this contract, which states:

> *Equipment must be Energy Star® compliant and any proposal must contain proof of the proposed equipment's Energy Star® rating.*

> ***Paper Specifications***
> *All proposed equipment shall be compatible with using recycled paper, up to and including 100% Post Consumer Waste (PCW) paper. Service personnel may not fault the use of recycled paper for equipment failures, as long as the recycled paper in use meets the standard paper specifications (e.g., multi-purpose, copy, or laser paper). Additionally, all proposed equipment shall be guaranteed by the manufacturer to accomplish 100% duplexing with 30% PCW paper.*

> *Successful Vendors shall guarantee that all of their equipment is able to use the 100% PCW recycled content paper and is able to accomplish 100% duplexing with 30% PWC, without maintenance problems.*

> ***Environmental, Special Terms and Conditions***
> * *All Equipment shall meet, at a minimum, the following emission standards:*
> * *5.5.1.1 Equipment shall not emit ozone in excess of 0.02 mg/m3;*
> * *Equipment shall not emit dust in excess of 0.25 mg/m3;*
> * *Equipment shall not emit styrene in excess of .11 mg/m3.*
> * *Equipment must use returnable, recyclable or remanufactured toner containers and the Successful vendor will provide the Customer with the method to return the containers to the Successful Vendor at no addition charge.*

- *Equipment offers the use of an organic photoreceptor or, at a minimum, a photoreceptor that does not contain arsenic, cadmium or selenium.*
- *Equipment uses toner that is free of carcinogenic, mutagenic or teratogenic substances.*
- *The Successful Vendor will maintain an environmental performance plan and goals, including an existing pollution prevention plan and environmental justice policy.*
- *The Successful Vendor shall possess ISO 14001 certification or other environmental management system or processes currently adopted and in operation.*

WSCA also offers **Digital Print & Quick Copy Contract** (WSCA-UT) w14-2011, which provides contracting services with Office Depot, Standard Register, and OfficeMax. Users can request print jobs that are double-sided (sometimes at a lower price than single-sided print jobs) and that are on recycled-content paper.

If states decide to issue their own bid solicitation, they can look to other states that have already added green attributes to their contracts. For example, states such as **Massachusetts** and **California** have successfully contracted for imaging equipment that meets green criteria, going into great detail to specify individual environmental attributes. While these have been pioneering efforts, they may not serve as suitable models because they were issued before the EPEAT standard for imaging equipment was adopted.

WHICH PRODUCTS ARE NEEDED?: PRE-BID RESEARCH

What Types of Products Do My Contract Users Need?

Whether buying or leasing, you can use the same green specifications for choosing equipment that best minimizes human health and environmental impacts. In addition, ensure that the equipment will be covered by a service contract that respects your environmental specifications. In particular, make sure that your service vendors support your use of recycled paper and remanufactured toner/ink cartridges.

How will you match the volume of expected printing and/or copying needs with the appropriate size machines?

Determine the expected number of imprints (copying or printing) per month for each machine that will be purchased. Historic volumes should be available from image counters on previous machines or estimates of work-flow from current users.

If previously separate technologies will be consolidated into MFDs and/or if equipment will be networked to reduce duplication, then adjust cumulative past use estimates to account for heavier use on shared machines. At the same time, account for the potential for scanning and faxing to reduce the need for copying and printing. Buying "too much machine" can require higher energy use than necessary.

Buyers Laboratory (BLI), an independent laboratory that tests imaging equipment and provides guidance on its purchase and use, publishes **recommendations** that pair up typical monthly volume expectations with appropriate types of machines.

Should the machines provide color or only black and white?

While color capability has become less expensive over the past few years, it is still more expensive than black and white. However, some machines also offer management control over granting access to different features, such as color printing. An office may reserve one or more color-capable machines for special projects, while providing monochrome (black and white) machines for most uses. Black and white printing is often more easily recyclable than color.

Will MFDs fulfill the need?

An office with heavy copying or printing needs (such as a graphic design department or a print or copy shop) may centralize large, heavy-duty independent copiers and printers, and then distribute smaller, lighter-duty MFDs for more general office use. Networking staff computers to various copying and printing options can allow elimination of most desktop printers without sacrificing ease and convenience, thereby reducing the number of imaging machines needed overall. MFDs will significantly consolidate space requirements.

Should the MFDs be copier-based or printer-based?

Printers and copiers were originally designed on very different technology platforms, but the most useful features of each are now frequently migrating to the other as well. Whether intended projects are more likely to require copying versus printing capabilities will help inform which type of MFDs to buy.

Printer-based MFDs tend to replace single-function printers. They also offer light copier capabilities, but heavier copier needs would probably be better met by a copier-based MFD.

Both printer-based and copier-based MFDs can be networked so that many users can access the same equipment, thereby reducing energy use, minimizing multiple machine clutter, and clearing desk space that formerly held printers, scanners, and/or other bulky equipment.

Evaluate each MFD's control panel to ensure that it is appropriate for your office's use and likely staff training level. Copier-based MFDs tend to have larger and more complex control panels because they usually are built to handle more complex operations than printer-based MFDs. If staff find them difficult to use, some of the resource-saving features may not be accessed.

Request demonstrations of potential equipment choices so that purchasers and end-users can make informed decisions.

This may be appropriate before issuing a bid solicitation, or preferred for evaluation of the actual bid results.

Will you need additional equipment functions?

Carefully assess your office's realistic needs to avoid buying "too much machine." Functions (e.g., faxing) that are rarely needed or might only "possibly" be needed in the future, may be better met with occasional access to a specified machine rather than building it into every imaging machine that is purchased.

Are there product categories that may not have sufficient EPEAT-registered options?

You may find that the complexity of a machine you need requires options that are not EPEAT-qualified. (Plotters may be in this category.) Identify these possibilities before issuing the bid solicitation so that you can adapt the specifications for these particular categories and prevent the receipt of non-responsive bids that may occur if these exceptions are not carved out.

What type of building will the equipment reside in?

Some buildings, such as those whose daily operations are LEED-certified, require additional and specific environmental product certifications. Similarly, it is important to know whether your jurisdiction has a policy requiring the use of EPEAT-registered electronics, ENERGY STAR-rated office equipment, or other environmentally preferable products.

GREEN CERTIFICATIONS AND STANDARDS

Up until very recently, green attributes for imaging equipment were distributed among several different and complex standards. But in October 2012, EPEAT published a new comprehensive multi-attribute standard that significantly simplifies the environmental evaluation for this product category. EPEAT published the initial **registry** of its products in early 2013.

Multi-Attribute Certifications for Imaging Equipment

EPEAT

Purchasers will most likely be familiar with EPEAT as a U.S. national multi-attribute environmental rating system for computers and monitors. In October 2012, a new **multi-attribute environmental standard (IEEE 1680.2) for imaging equipment** was adopted that will serve as the basis for expanding EPEAT to include imaging equipment. A multi-stakeholder process defined superior environmental performance and rewards in the new standard for imaging equipment products.

This standard is expected to be widely referenced by state and federal governments and other public agencies when developing their imaging equipment contracts, although many are likely to simply specify that their imaging equipment must be listed in the EPEAT Registry. EPEAT registration is awarded at three levels (Bronze, Silver, and Gold), depending on the number of criteria that were achieved in the standard.

The IEEE Imaging Equipment Standard is designed to address a wide range of environmental criteria, and incorporates other existing certifications and standards where applicable. As a result, for example, an imaging device that is EPEAT-registered will also be ENERGY STAR-qualified. The standard includes required and optional criteria. All required criteria must be met to obtain the Bronze level of performance. Products that meet additional optional criteria can reach Silver or Gold levels, which demonstrate greater environmental performance.

EPEAT's registry works by having manufacturers self-declare their products that meet the standard requirements and state which criteria have been met. EPEAT then employs post-declaration verification by regularly selecting products from the registry and utilizing independent experts to verify that the chosen products meet the selected criteria.

Additional information about the new EPEAT IEEE 1680.2 requirements is in **Appendix A**.

Other Relevant and Credible Environmental Programs

BLI Pick of the Year Award

BLI's Pick of the Year Award, a performance standard, gives special recognition to products that excel in BLI's testing evaluations. While these awards do not focus on environmental attributes, they can be useful to purchasers because they highlight performance excellence. BLI describes Pick winners as rising "above the competition in key areas such as value, feature set, ease of use, ease of administration, hardware compatibility, software integration, security and support."

UL/EcoLogo CCD-035 Office Machines

Prior to the new EPEAT standard, **UL/EcoLogo** has provided a multi-attribute third-party certification for MFDs, copiers, printers, faxes, and mailing machines, based on the robust German Blue Angel certification. EcoLogo evaluated products for restricted or hazardous substances; design for extended life, reuse, and recycling; and energy and paper savings. Most of the products certified to this standard have been specific to Canadian markets.

BID SPECIFICATIONS

While WSCA and states such as Massachusetts and California have developed contracts that feature green imaging equipment, the EPEAT standard promises to be more comprehensive than any previous specifications.

Therefore, the easiest way to specify imaging equipment that meets green criteria is to require them to be in the EPEAT registry. Since the standard is just now being implemented, EPEAT recommends that purchasers require only the Bronze level, in order to prevent limiting competition, anticipating that manufacturers will likely build up over the next two years to the Silver and Gold levels. However, purchasers may want to give extra points for products achieving EPEAT recognition at the Silver or Gold levels.

You may have already clarified exactly which machines you wish to purchase through research, vendor demonstrations, and pilot tests. In that case, the bid solicitation would specify those machines. But even then, the products should meet the following specifications, which can also be used to solicit proposals for equipment that will meet your needs and that can be tested and evaluated after bids have narrowed down the number of possibilities.

Minimum Requirements (Specifications)

Under the Minimum Requirements, products must be:

1. EPEAT (IEEE 1680.2), minimum Bronze level. Products must be listed in the EPEAT Registry.
2. All proposed equipment shall be compatible with using recycled paper, up to and including paper with 100% postconsumer recycled fiber. Service personnel may not fault the use of recycled paper for equipment failures, as long as the recycled paper in use meets the standard paper specifications (e.g., multi-purpose, copy, or laser paper). Additionally, all proposed equipment shall be guaranteed by the manufacturer to successfully duplex with 30% postconsumer recycled-content paper, without maintenance problems.
3. Products should ship with duplex mode set to "on" by default.
4. If you have identified a category of product that has insufficient EPEAT-registered options, advise bidders to present their choices with information about their products' environmental qualifications (e.g., ENERGY STAR-rated, RoHS-compliant, duplexing capable, etc.).

Additional Desirable Attributes

1. Purchasers can offer vendors extra points for products that meet the EPEAT Silver and Gold levels.

2. Purchasers can ask vendors to describe their product "takeback" program and give additional credit to vendors that use electronics recyclers that are certified by the eStewards or R2 programs.

Brown List

While some States may want to use these specifications to add green products to their contracts, other States may want to prohibit specific products for which there is a plentiful supply of cost-effective environmentally preferable alternatives that meet the State's needs in terms of form, function, and performance. To accomplish this, States can develop a "brown list" of products that they can include in the bid solicitation document notifying bidders that specific types of products may not be supplied on that contract. For this product category, the "brown list" could include products:

- Not listed on the EPEAT Imaging Equipment registry, if they are in product categories with sufficient registry product listings (such as multifunction devices or printers).

- Without automatic duplexing language capabilities, if duplexing is common among competitors in that product category.

- Not ENERGY STAR qualified.

- That are individual facsimile machines or scanners, when those functions could be included in multifunction devices.

- That are desktop printers and copiers that are not network capable.

- That do not automatically power-down to energy-saving mode when not in use.

- That do not accept recycled paper with up to 100% postconsumer recycled fiber.

- That do not accept remanufactured toner cartridges.

ONCE THE BIDS ARE IN: EVALUATING BIDS

Verifying Certifications and Claims

Even when particular attributes are specified, sometimes the products bid do not actually meet them. Purchasers should verify that the products bid match their specifications.

- Is the product listed in the EPEAT registry? Check the **EPEAT website** for its registry of imaging equipment products.
- If certified by UL/EcoLogo or any other certification or standards program, is the product listed on the appropriate website? If not, require that the bidder provide documentation. Only accept documents that indicate an actual award, not applications or other verifications-in-progress.
- Successful bidders should be required to supply an affidavit confirming that any service technicians that repair the equipment under contract will comply with the recycled paper requirements and support the use of remanufactured toner cartridges.

Awarding the Contract

- Some imaging equipment vendors represent many manufacturers, while others carry only one brand. You may need to award multiple bids in order to get the range of products and brands you desire.
- If a category of products has insufficient competition among EPEAT-registered products, compare the green attributes it does have in order to determine the most environmental product. The EPEAT description in **Appendix A** will provide guidelines for desirable attributes.
- If you chose not to prequalify equipment choices before the bid, you may need a time period after the bids are presented to request demonstrations of the machines under consideration, along with performance testing, before making a contract decision.

Assessing Best Value

Often the initial cost of an imaging machine can be eclipsed by the cost of the consumables, such as toner, that are required to operate it over its lifetime. Calculating the Total Lifecycle Cost Analysis (LCCA) is especially critical for comparing the costs of various imaging equipment choices. Relevant considerations include:

- What types of toner cartridges are available and how many copies do they claim to provide? Choices may include high yield toner cartridges as well as original (OEM), remanufactured, biobased polymer toner, and other options. Be sure to account for the different numbers of copies per type of toner cartridge when comparing costs across different brands and different machines, since the number of copies rated per cartridge type is not standardized.
- Are the toner cartridges designed to be used efficiently? Some machines consolidate colors into one cartridge, so that when one color is exhausted, all need to be replaced, an

unnecessary cost and waste of the other toners. Some color copiers use some of the colored toners even when printing in only black-and-white, which requires replacement of the color cartridges more often than should be necessary.

- Can the equipment be networked? How many users can it support?

- What cleaning, maintenance, and repair services are required, how often, and what are the costs for those?

- What is a typical "lifetime" to expect for the machine? This may be a manufacturer estimate or it may be a typical depreciation or rotation schedule in your jurisdiction for updating electronic equipment.

- Is there a cost for equipment end-of-life take-back or recycling?

The total lifecycle cost of a copier, printer or MFD can generally be represented by:

> *Initial cost + (energy cost x expected length of lifetime) + (ink/toner cost x replacement frequency x expected length of lifetime) + (service contract x lifetime) + take-back cost at equipment end-of-life*

When comparing a machine that easily duplexes to one that does not, the cost of paper should be added into the calculation since duplexing dramatically reduces paper use up to approximately 40%.

If there is a limit to the equipment's networking capabilities, account for any increase that may indicate to support all users.

Buyers Laboratory outlines a method of calculating the **total cost of ownership**, which can be calculated and presented by the vendor or accessed for a membership fee. The **EU Energy Star** program provides an online calculator for generic equipment types, although it requires conversion from U.S. dollars to Euros. The **U.S. ENERGY STAR** program also provides a spreadsheet calculator, although it only calculates energy cost savings and not total lifecycle costs.

VENDOR EVALUATION

Governments can extend the influence of their direct purchases by encouraging vendors to develop more sustainable business practices themselves. This offers value to the state by reducing that business' environmental impacts. Their influence can even extend to their subsequent supply chains as well. If the vendor will also be responsible for servicing the imaging equipment, their understanding of and commitment to sustainability will be most important to furthering your own.

The Vendor Sustainability Questionnaire in **Appendix B** is designed to help purchasing agents evaluate whether their vendors conduct their business in such a way as to result in environmental and health benefits to the state. In addition to the general questions, some are specific to vendors supplying imaging equipment, including:

- Does your company conduct trainings for contract users to learn accurate and optimal use of your products?
- How does your company minimize the delivery packaging for its imaging equipment, especially polystyrene foam?
- Do you take back toner cartridges for remanufacturing or recycling? High-quality remanufacturing conserves the most resources and best reduces waste by reusing parts of the cartridge that are still in excellent condition. Recycling involves melting down the cartridge and its components so that the resulting materials can be used to make new products. You will also want to know whether the company provides rebates for returned spent cartridges or discounts on new cartridges when old ones are returned.
- Do you have a hardware recycling program that refurbishes, remanufactures, or recycles the imaging equipment when it has reached the end of its useful life?
- Are the recyclers that handle electronic waste on behalf of your company certified by either the eStewards or R2 Program?
- Are the products you are offering made by companies that are members of the Electronic Industry Citizenship Coalition (EICC) and that follow the Electronic Industry Code of Conduct, which are guidelines that have been "established to ensure worker safety and fairness, environmental responsibility, and business efficiency?"

MAXIMIZE THE GREEN IMPACT OF IMAGING EQUIPMENT

When selecting imaging equipment, purchasers should understand what modes are available for the device and how they function. To save energy and money, the product should automatically power down into a standby or sleep mode when not used for a period of time. The vendor and/or manufacturer should provide instructions on how this function works and how it can be set up, and, if possible, shipped it preset by default. Having the device automatically power down during periods of limited or no use, such as during the night, will greatly reduce costs.

Toner and ink cartridge use can be quite expensive over the life of the equipment. Use remanufactured, high-yield, or certified biobased toner and ink cartridges whenever practicable. Federal law forbids manufacturers from voiding equipment warranties because of remanufactured toner cartridge use. Choose equipment that supports their use.

Another large contributor to lifecycle costs of imaging equipment is the cost of paper used for printing and copying. Not only will decreasing paper use reduce environmental impacts, it will also save money. In order to reduce paper use, states should mandate that printers and copiers are provided with a duplexing system, which means the device will print on both sides of the paper rather than on two individual sheets of paper. Since many users do not adjust the settings of the machine after it is installed, purchasers should require the duplexing mode to be set by default in order to maximize the chance that it is used by end-users and minimize the setup process for new equipment. The Federal Electronics Challenge published a **report on methods** for reducing the use of paper and ink when printing.

Agencies can adopt a policy guiding their procurement as well as recycling and disposal of imaging equipment and other electronic products. For example, the U.S. federal government has a policy directing agencies to choose EPEAT-registered products for at least 95% of their purchases. The **State Electronics Challenge** (SEC) has a sample resolution that states can adopt, which commits them to "following the SEC guidelines for environmentally sound procurement, use and disposal of all electronic equipment." The SEC also offers states a wide array of resources to help them to procure environmentally preferable office electronics (including imaging equipment) and track the benefits of their actions in this area.

If contracting for copying or printing services, states can include similar environmental specifications in their bid solicitation, including requirements or preferences for the use of recycled paper and sustainable toner cartridges as well as for recycling of imaging equipment when it reaches the end of its useful life.

WHAT'S ON THE HORIZON?

As the number of products listed in the EPEAT registry grows, states can consider changing the minimum specification to include products that meet EPEAT Silver or Gold levels when sufficient products are available.

Credits

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Appendix A:
Detailed Description of IEEE 1680.2 Standard used for the EPEAT Registry for Imaging Equipment

Electronic Products Environmental Assessment Tool (EPEAT) (IEEE 1680.2)

In October 2012, IEEE published 1680.2, *Standard for Environmental Assessment of Imaging Equipment*, to be used as the foundation for the Electronic Products Environmental Assessment Tool (EPEAT) for copiers, printers, and multi-function devices. According to IEEE, "this standard is intended to provide a tool for government, institutional, corporate, and consumer purchasers to identify products that demonstrate environmental leadership." IEEE created this standard through a multi-stakeholder process to define and reward superior environmental performance for imaging equipment products, expanding on the previous IEEE 1680 standards for electronics such as computers and monitors. Government agencies and other institutional purchasers are likely to widely adopt this standard for their imaging equipment purchases.

Executive Order 13514, on *Federal Leadership in Environmental, Energy, and Economic Performance*, which was signed by President Obama in 2009, mandates that 95% of electronics purchased by federal agencies be EPEAT-registered. EPEAT is the body that manages the registry of products that comply with the IEEE 1680.2 standard and it is common for industry to just refer to EPEAT instead of the specific standard number.

The EPEAT registry works by having product manufacturers self-declare their products that meet the standard requirements and state which criteria have been met. EPEAT then employs post-declaration verification by regularly selecting products and criteria from the registry and utilizing independent experts to verify that the chosen products meet the selected criteria.

The EPEAT imaging standard addresses a wide-range of environmental attributes, referencing other existing certifications and standards where applicable. As a result, for example, a MFD that is EPEAT-registered will also be ENERGY STAR-qualified. The standard includes required and optional criteria. All required criteria must be met to obtain the Bronze level of performance. Products that comply with additional optional criteria can reach Silver or Gold levels, which demonstrate greater environmental performance.

The main criteria sections of the standard include:
- Reduction or elimination of environmentally sensitive materials
- Materials used in the product
- End-of-life management of the product
- Corporate environmental performance and reporting
- Packaging toxics, recycled material, and take-back

- Product design for end of life, such as recyclability, disassembly, extended life, and repairability
- Energy conservation
- Consumables criteria for copy paper and ink/toner cartridges
- Indoor air quality associated with emissions of products

Standards Incorporated into the EPEAT Standard (IEEE 1680.2)

European Union Restriction of Hazardous Substances (RoHS)

The European Union's RoHS Directive (2002/95/EC: Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment) sets limits of <1000 ppm on the presence of the following substances within homogeneous materials: cadmium, mercury, lead, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDEs). The RoHS Directive was "recast" in 2011 (as 2011/65/EU) with more stringent limits on mercury and additional toxic chemical restrictions. Imaging equipment listed in the EPEAT registry meet all the requirements of the RoHS Directive.

Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH)

REACH is a regulation of the European Union ((EC) No. 1907/2006) that aims to protect the environment and human health by requiring manufacturers to assess the risks posed by toxic chemicals. Under the REACH regulation, the European Chemicals Agency maintains a Substances of Very High Concern (SVHC) list, which identifies chemicals for which there is significant risk and that may be banned or restricted for use. Such chemicals may be carcinogens, mutagens, reproductive toxins, persistent and bio-accumulative chemicals, or other chemicals that can cause serious harm to human health or the environment.

Many imaging equipment products that are EPEAT-registered do not contain more than 0.1% by weight of any substance listed on the SVHC list. Although the EPEAT standard does not require all products to meet this criterion, those that do are awarded optional points towards achieving a Silver or Gold rating. Purchasers can see if a product earned points for meeting the REACH criteria by checking its EPEAT registry listing.

Brominated and Chlorinated Flame Retardants

Brominated flame retardants (BFRs) and chlorinated flame retardants (CFRs) are commonly used chemical classes added to the plastics of electronics to reduce flammability. These chemicals are potentially hazardous to humans and wildlife, and can persist and bioaccumulate in the environment.

MFDs and other types of printers and copiers listed in the EPEAT registry do not contain BFRs or CFRs in any of the large plastic pieces because these substances are prohibited in the EPEAT standard. Purchasers may consider ensuring that the entire product is completely free from BFRs and CFRs, rather than just the large plastic pieces; however this criterion is optional, not required, for products in the EPEAT registry.

Indoor Air Quality

MFDs emit chemicals into the surrounding air, both from the general components (mostly plastics) they are constructed from as well as during use from ink and toner. As a result, all printing and copying machines impact the quality of indoor air that building occupants breathe every day. Two things can be done to minimize potential indoor air quality impacts on human health:

- The first is to locate all imaging equipment so that is not in direct proximity to where an employee sits all day and ensure that there is adequate ventilation in the space surrounding the device.
- The second is to choose imaging equipment that has low emissions of potentially harmful chemicals. The EPEAT imaging equipment standard limits emissions of total volatile organic compounds (TVOCs), benzene, styrene, ozone, and dust based on well-established testing standards (**ISO/IEC 28360:2007** and RAL-UZ 122).

ENERGY STAR: A Single-Attribute Energy-Efficiency Standard

The energy used by the imaging equipment both while functioning as well as in standby mode contributes significantly to the lifecycle costs of the product. By choosing a product that consumes less energy during use and in standby and sleep modes, if applicable, states and other public agencies can lower their electricity bills. To find a product that uses less energy, states should select products that are ENERGY STAR-qualified. Since EPEAT requires products to comply with current ENERGY STAR criteria, purchasers requiring EPEAT registration do not need to specify ENERGY STAR separately.

The current ENERGY STAR requirements for imaging equipment are contained in _**Product Specifications for Imaging Equipment, Version 1.2**_, although a new revision is currently under development. The requirements cover nearly all types and technologies of imaging equipment, including both standard-format and large-format devices. There are currently over 3,500 products qualified by ENERGY STAR from a wide range of manufacturers. A joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy, ENERGY STAR requires third-party product testing in an EPA-recognized laboratory that meets international standards, review by a certification body for eligibility, and ongoing testing to ensure products meet the standard.

In order for an imaging equipment product to obtain ENERGY STAR qualification, it must:

- Be sold with capability for automatic duplexing mode present;
- Be under the threshold for Typical Electricity Consumption (TEC) based on formulas provided;
- Meet requirements for default delay time for the machine to be put into sleep mode;
- Be under the threshold for power consumption in sleep mode based on formulas provided; and
- Use an internal power supply that meets energy-efficiency requirements or an external power supply that is ENERGY STAR-qualified.

Appendix B
Vendor Sustainability Questionnaire

For firms providing Goods and Services
Please check and complete relevant items in this survey questionnaire
Return with Bid/Proposal

VENDOR NAME _____ Date _____

Website

_____

Address

_____

_____

Contact Name _____ Title _____

Contact Phone _____ Email _____

Supply Category _____

Please check off applicable items and provide supporting documentation, as appropriate.

Internal Operations and Policies

❑   1.   Has your company implemented any of the following environmental policy
           initiatives for your facilities? (Please attach relevant policies or links)

           ❑   Environmental or Sustainability Policy
           ❑   Climate Action Plan
           ❑   Zero Waste Policy or Plan
           ❑   Toxics Reduction Strategy or Policy

- ❑ Water Reduction Strategy or Policy
- ❑ Green Transportation Plan for employees
- ❑ Sustainable Purchasing Policy - Please describe representative products bought for your facilities and list sustainability attributes - e.g., recycled materials, recyclable, reusable, non-toxic, biodegradable, EPEAT.

  _____
  _____
  _____
  _____
  _____

❑ 2. Does your company meet an environmental management standard (e.g., ISO 14001, EMAS)? (Please describe and document)

  _____

❑ 3. Does your company have a recycling and/or composting collection program? (Please describe)

  _____
  _____
  _____

❑ 4. Has your company received any environmental and/or sustainability awards in the past five years? (Please describe)

  _____

❑ 5. Is your company certified as a Green Business? (Please list certifying agency and provide documentation)

  _____

❑ 6. Does it hold other environmental certifications? (Please list and document)

  _____
  _____

❑ 7. Does your company require sustainability principles in managing its supply chain? (Please describe)

  _____
  _____

_____

_____

❑   8. Has your company ever been cited for non-compliance of an environmental or safety issue (please describe date, reason, outcome)

_____

_____

_____

Facilities]

❑   1. Have any buildings that you own or lease been LEED certified by the U.S. Green Building Council?

Describe:_____

_____

_____

❑   2. Does your company create or purchase renewable energy in its operations?

❑On-site   ❑Off-site   ❑Holds Green-E certification

_____ Percentage of overall energy derived from renewable sources

Purchases renewable energy credits (RECs)
(Please provide documentation)

Packaging

❑   1. Does your company provide reusable shipping containers?

❑Always   ❑On request

❑   2. Do the shipping boxes used for order deliveries meet or exceed the U.S. EPA minimum of 25% postconsumer recycled content?

❑   3.   Does your company employ shipping-container take-back services or carton return? (Please describe)

         _____
         _____
         _____

❑   4.   Are the shipping containers and/or packaging used compostable? Is it certified commercially compostable? (Please describe)

         _____
         _____
         _____

Shipping

❑   1.   Is your company an EPA SmartWay Partner or are products shipped via any EPA SmartWay Partners? _____

❑   2.   Are any of your company's passenger vehicles and light-duty trucks EPA SmartWay certified? _____

         Percentage _____

❑   3.   Do your fleet vehicles utilize alternative fuels (e.g., Ethanol, E85, Biodiesel, Natural Gas)

         _____
         _____
         _____

❑   4.   Does your company minimize shipping energy and environmental impacts in other ways? (Please describe)

         _____
         _____
         _____

Reporting

☐ 1. Does your company produce a public sustainability or environmental report about its policies and operations? Please provide a copy or link and indicate compliance with any international standards (e.g., Global Reporting Initiative, Carbon Disclosure Project, ISO 14000)

_____
_____
_____

☐ 2. Does your company label environmental products listed in its catalog, website or brochures? If the products are generically labeled as "green," what criteria are used to determine which products qualify?

_____
_____
_____

☐ 3. Can you produce purchase reports for customers that identify and sort by the products' individual sustainability attributes (e.g., recycled, EPEAT, not just "green" designation)?

_____
_____
_____

☐ Other environmental achievements: Please specify

_____
_____
_____

Please complete the Product Details Table on the next page.

Product Information and Supply Chain

- List each product individually (duplicate sheet as needed)
- Respond to applicable questions

PRODUCT DETAILS			Product 1	Product 2	Product 3	Product 4	Product 5
Product Description (including Order #)							
Manufacturer							
EPEAT (Y/N) Bronze, Silver or Gold)							
If yes, indicated EPEAT Bronze, Silver or Gold							
If no, is product on ENERGY STAR List? (Y/N)							
Product Recycled Content		Post-consumer (0-100%)					
		Total Recycled Content (0-100%)					
RoHS-Compliant? (Y/N)							
Does this product auto-duplex? (Y/N)							
P A C K A G I N G		Reusable (Y/N)					
		Take-back (Y/N)					
		Total Recycled content (0-100%)					
		% Post-consumer content (0-100%)					
		Certified Compostable (Y/N)					
		Accepted in State's Recycling Program? (Explain)					