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Joint Committee Correspondence

TO: Joint Committee on Environmental Leadership Standard for Servers

FROM: Dr. Matthew Realff, Chairperson of the Joint Committee

DATE: December 22, 2014

SUBJECT: Proposed STRAW BALLOT for 426, Environmental Leadership Standard for Servers

The following straw ballot is based on motions made during the Joint Committee meetings on November 5th, 6th, 13th and December 9th and 16th 2014. The ballot document contains the full standard with revisions that the Joint Committee motioned to go to ballot.

Please review the proposal and return your ballot **by the ballot due date of January 12th, 2015** via the online workspace (http://standards.nsf.org).

When adding comments, please identify the section number/name for your comment and add all comments under one comment number where possible. If you need additional space, please upload a word or pdf version of your comments online via the browse function.

Straw Ballot:

Changes to the draft standard were recommended by task groups at the November 5th, 6th, 13th and December 9th and 16th, 2014, Joint Committee meetings. Below is a list of the sections being balloted.

- Section 3 Definitions
- Section 4 Conformance, Evaluation and Assessment
- Section 5 Energy Efficiency
- Section 6 Substances of Concern
- Section 7 Preferable Materials use
- Section 8 Product Packaging
- Section 9 Design for Repair, Reuse and Recycling
- Section 10 Product Longevity
- Section 11 Life Cycle Assessment and Greenhouse Gas Emissions
- Section 12 Responsible End-of-Service/End of Life Management
- Section 13 Corporate Environmental Responsibility
- Removal of Section 14 Innovation in Environmental Performance
- Annexes

The meeting summaries and the recommended revisions that were motioned to ballot are available for your review. The sections available for straw ballot and comment are included in the ballot document

below. The proposed additions are shown using grey highlight, and deletions are shown through ~~strikethrough~~.

Public Health Impact

The proposed language will have no negative impact on public health.

If you have any questions about the technical content of the ballot, you may contact me in care of:

Dr. Matthew Realff, Chairperson,
Joint Committee on Environmental Leadership Standard for Servers
c/o Joint Committee Secretariat,
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NSF 426 – Environmental Leadership Standards for Servers
DRAFT DOCUMENT

1 General

1.1 Purpose

The purpose of this standard for servers is to establish product environmental performance criteria and corporate performance metrics that exemplify environmental leadership in the market.

The standard provides a framework and consistent set of performance objectives for manufacturers and the supply chain in the design and manufacture of servers and its components. For purchasers, this standard provides a consensus-based definition of key environmental attributes and performance metrics, alleviating individual purchasers from the arduous and complex task of defining environmental performance for servers. This standard can be used within an established system for the identification of environmentally preferable products by purchasers and to provide market recognition for conformant products and brand manufacturers.

This standard was developed based on the principle that only environmentally leadership products, those in the top third of the market, are expected to qualify to the standard at the bronze level at the date of publication of the standard. Only a very few, if any, products are expected to meet the highest performance level (gold) at the date of publication of the standard.

This standard will be continually maintained and periodically reviewed to ensure that the definition of environmental leadership as reflected in the performance criteria progress with the evolution of technology and services and environmental improvements in the product sector.

1.2 Scope

This is an environmental leadership standard for computer servers as defined in the ENERGY STAR Program Requirements for Computer Servers Version 2.0: blade, multi-node, rack-mounted, or pedestal form factor computer servers with no more than four processor sockets in the computer server (or per blade or node in the case of blade or multi-node servers).

This standard establishes measurable criteria for multiple levels of environmental leadership achievement and performance throughout the lifecycle of the product. This standard addresses multiple attributes and environmental performance categories including energy efficiency, reduction of substances of concern, preferable materials use, product packaging, design for reuse and recycling, product longevity, responsible end of life management, life cycle assessments and greenhouse emissions, and corporate responsibility.

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2 References *(to be completed)*

2.1 Normative References

2.2 Informational References

3 Definitions *(not a complete list of draft definitions – tracked in a separate document)*

Additives and fillers:

Compatible recycling streams:

Commonly available tools: A tool which is widely used, readily available on for purchase and can be purchased by any individual or business without restrictions.

Computer server: As defined in the ENERGY STAR Program Requirements for Computer Server Version 2.0, the scope of this standard includes computer servers that provide services and manages networked resources for client devices (e.g., desktop computers, notebook computers, thin clients, wireless devices, PDAs, IP telephones, other computer servers, or other network devices). A computer server is sold through enterprise channels for use in data centers and office/corporate environments. A computer server is primarily accessed via network connections, versus directly-connected user input devices such as a keyboard or mouse. For purposes of this standard, a computer server must meet all of the following criteria:

- is marketed and sold as a Computer Server;
- is designed for and listed as supporting one or more computer server operating systems
- (OS) and/or hypervisors;
- is targeted to run user-installed applications typically, but not exclusively, enterprise in nature;
- provides support for error-correcting code (ECC) and/or buffered memory (including both buffered dual in-line memory modules (DIMMs) and buffered on board (BOB) configurations).
- is packaged and sold with one or more ac-dc or dc-dc power supplies; and
- is designed such that all processors have access to shared system memory and are visible to a single OS or hypervisor.

Firmware: System, hardware, component, or peripheral programming provided with the device, hardware or component to provide basic instructions for hardware to function inclusive of all applicable programming and hardware updates.

Intentionally added:

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Light sources:

Manufacturer: The legal entity that is the owner or the licensee of the brand or trademark under which the product in the scope of this standard is placed on the market, and:

- Manufactures a product, and/or
- Has a product designed or manufactured, and/or
- Acquires a product for sale under their brand or trademark

(JC Straw Balloted June 2014)

Recyclable material streams:

Plastic film and stretch wrap:

Postconsumer recycled plastic:

Product: A computer server:

1) Within the scope of the ENERGY STAR Program Requirements for Computer Servers Version 2.0; and,
2) A marketing model with one or more specific configurations identified, inclusive of the product's full range of configurations and as tested for compliance with ENERGY STAR.

ENERGY STAR Program Requirements for Computer Servers Version 2.0 defines a computer server as all hardware and materials contained within the chassis, including the power supply unit.

(JC Straw Balloted June 2014)

Recycled feedstock:

Recycled fiber: Note that recycled fiber can be postconsumer or postindustrial.

Supply chain management system:

4 Conformance, Evaluation and Assessment

This standard is divided into nine ~~ten~~ environmental categories consisting of prerequisite criteria and optional criteria:

- Energy Efficiency

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- Substances of Concern
- Preferable Materials Use
- Product Packaging
- Design for Reuse and Recycling
- Product Longevity
- Responsible End of Life Management
- Life Cycle Assessments and Greenhouse Gas Emissions
- Corporate Responsibility
- ~~Innovation~~

4.1 Criteria

A summary of all criteria in this standard, including prerequisites and optional points, is provided in Annex A.

4.1.1 Prerequisites

Each category has prerequisites that are required in order to conform to this standard.

(Insert table summarizing prerequisites by category)

4.1.2 Optional Points

Once the prerequisites are met, products may achieve higher levels of conformance by meeting a specified percentage of optional criteria.

4.1.3 Product and Corporate Criteria

This standard includes two types of criteria:

- Product criterion: Applies to the product declared to conform to the standard.
- Corporate criterion: Applies to the company and not specifically the ~~registered~~ product declared to conform to this standard. These criteria are noted in the standard.

4.1.4 Country or Region Specific Criteria *(JC Straw Balloted June 2014)*

With regard to being region or country specific, there are only the three following options for criteria:

- If the criterion does not specify, then requirements must be met globally (i.e., wherever the product is sold); or
- If the criterion specifies, "This requirement is applicable only in countries or regions for which the product is declared to conform to this standard", then the requirement must be met for conformance in those countries or regions; or
- The criterion may specify, "This criterion may be declared differently by country or region."

4.1.5 Units of Measure *(JC Straw Balloted June 2014)*

Unless specified otherwise, units of measure within this standard shall be reported in metric units.

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4.1.6 Dated and Undated References *(JC Straw Balloted June 2014)*
A reference to another standard or regulation is either dated or undated.

- Dated standards or regulations remain the reference in this NSF standard even if the referenced standard or regulation is subsequently amended or replaced.
- Undated standards or regulations will automatically update within this NSF standard when the referenced standard or regulation is updated (including any amendments or corrigenda). In order to remain in conformance with this NSF standard, the product and/or manufacturer shall conform to the referenced aspects of the updated standard or regulation when it goes into effect, as applicable.
- For EU Directives, which contain the adoption date in their title, unless explicitly indicated otherwise when a Directive is referenced in this NSF standard, a new or updated Directive shall apply as the referenced Directive upon its enforcement date.

4.1.7 Declare, Disclose, and Document *(JC Straw Balloted June 2014)*
Within this standard, these three terms are used as follows:

- **Declaration/declare** – Information to be provided to a registry of declared products by the manufacturer at the time of product registration or certification; note that "declare" is also used to indicate conformance to the standard and individual criteria. If the manufacturer has the product third party certified, the information referred to in this paragraph shall be publicly disclosed on the manufacturer's website in the form of a certification report, or equivalent, issued by the certifying organization. If a manufacturer self declares, the information referred to in this paragraph shall be publicly disclosed on the manufacturer's website.
- **Disclosure/disclose** – information made available to the audience specified in criterion (e.g. purchasers, public, etc.).
- **Documentation/document** – information to be provided at time of verification.

4.2 Levels of Conformance
There are three levels of conformance:

- Bronze: Meets all prerequisites
- Silver: Meets all prerequisites plus 50% of the optional criteria points
- Gold: Meets all prerequisites plus 75% of the optional criteria points

The optional points can come from any of the environmental categories. Prerequisites can be assigned to levels of conformance.

4.3 Conformity Assessment Guidance
Guidance on conformity assessment is provided in Annex B.

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5 Energy Efficiency

5.1 Prerequisites

5.1.1 ENERGY STAR *(JC Straw Balloted June and October 2014)*

The product shall conform with the current version, and maintain conformance with any subsequent versions of the ENERGY STAR Computer Servers program, as per the requirements in Table 5.X below.

Table 5.X

Region or Country	Requirement
U.S. and Canada	• Product shall be ENERGY STAR certified
ENERGY STAR international partner countries or regions	• Product shall conform with the international partner countries' or regions' current ENERGY STAR Computer Servers Eligibility Criteria; or • Product shall be on the country's ENERGY STAR qualified product listing
Countries or regions that are not ENERGY STAR international partners	• Product shall conform with the current version of the U.S. and Canada ENERGY STAR Computer Servers Eligibility Criteria

Manufacturer shall declare to which of the above the product conforms. This criterion may be declared differently by country or region.

~~Products declared to conform to this standard:~~

- ~~In the U.S., products shall be ENERGY STAR certified, or~~
- ~~In the countries or regions covered by the international partner European Union ENERGY STAR program, products shall meet the ENERGY STAR Computer Server energy efficiency specifications, or~~
- ~~In other ENERGY STAR international partner countries or regions, products shall meet the ENERGY STAR Computer Server energy efficiency specifications and the program requirements of that ENERGY STAR international partner, or~~
- ~~In non-partner countries or regions, products shall meet the energy efficiency specifications of ENERGY STAR Computer Servers, but are not obligated to meet other program requirements.~~

~~Manufacturer shall declare to which of the above the product conforms. This criterion may be declared differently by country or region.~~

~~The product shall maintain conformance with any subsequent versions of the ENERGY STAR Computer Servers program, as per the requirements above.~~

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5.1.2 Allowable Temperature and Humidity Specifications (*JC Straw Balloted June 2014)*
Product specification shall support Class A1 allowable environmental operating range published in the American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE) Thermal Guidelines for Data Processing Environments, 3rd Edition, in Table 2.3 on a continuous basis.

5.1.3 Reduction of ENERGY STAR Idle State Power Allowances (Prerequisite for Bronze, Silver and Gold) (*JC Straw Balloted June 2014)*
The product shall meet the idle state power allowances specified in Table 5.1 below as prerequisites. The idle state power shall be measured as required in the ENERGY STAR Program Requirements for Computer Servers Version 2.0.

These requirements are applicable to only one and two socket products. "Not Applicable" may be declared ~~on the Product Registry by manufacturer~~ if the product is not a one or two socket system.

Table 5.1

Category (as used in ENERGY STAR[1])	Maximum Possible Number of Installed Processors (#P)[1]	Managed Server[1]	**Prerequisite for Bronze** Base Idle State Power Allowance, P_{base} (watts) (as required by ENERGY STAR[1])	**Prerequisite for Silver** Base Idle State Power Allowance (watts)	**Prerequisite for Gold** Base Idle State Power Allowance (watts)
A	1	No	47	30	18.8
B	1	Yes	57	37	22.8
C	2	No	92	60	36.8
D	2	Yes	142	92	57
Resilient	2	Yes	205	133	82

With additional memory allowance reduced from 0.75 watts per GB to 2 watts per DIMM for DIMMs of 16 GB or less, and 0.20 watts per GB for DIMMs over 16 GB. All other allowances kept the same as ENERGY STAR Program Requirements for Computer Servers Version 2.0.

Manufacturer shall declare the category and performance tier for the product.

5.2 Power Supply Efficiency (Optional)

5.2.1 80 Plus Program (*JC Straw Balloted June and October 2014)*
The product shall include power supplies rated through the 80 Plus Program and listed on the 80 Plus website (http://www.plugloadsolutions.com/80PlusPowerSupplies.aspx), or meeting the requirements:

Table 5.2

Power Supply Unit	80 Plus Level	Points

[1] ENERGY STAR® Program Requirements Product Specification for Computer Servers Eligibility Criteria Version 2.0

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Single Output	Platinum	1
	Titanium	2
Multi Output	Gold	1
	Platinum	2
	Titanium	3

Manufacturer shall declare ~~on the Product Registry~~ whether the product contains single output or multi output power supply units (PSUs).

5.3 Systems Energy Efficiency (Optional)

5.3.1 Energy Efficient Supply Chains (*JC Straw Balloted October 2014)*
Integrated circuits, printed wiring boards (PWB), or PWB assemblies if the facility manufactures the raw board itself, shall be manufactured by at least one supplier at a facility that is certified as Superior Energy Performance™ (SEP) Silver level or higher at the time of manufacture. Demonstration of conformance shall include documentation that the component(s) originated at a facility with SEP certificates provided through ANSI-ANAB-accredited SEP verification bodies.

Point value: 2

5.3.2 Reduce Energy Lost from Power Conversion (*JC Straw Balloted June 2014)*
The product shall operate at high voltage AC power as shown in Table 5.3 below to reduce energy loss from power conversion during distribution and provide an overall higher system efficiency. The product shall be tested using the methodology specified in the ENERGY STAR Program Requirements for Computer Servers.

Table 5.3

High Voltage AC Power	Points
400/230v or 480/277v	1
600v or higher	2

5.3.3 Advanced Allowable Temperature and Humidity Specifications (*JC Straw Balloted June 2014)*
Product specifications shall support the requirements below (Table 5.4) for allowable environmental operating ranges published in the ASHRAE Thermal Guidelines for Data Processing Environments, 3rd Edition, in Table 2.3 on a continuous basis:

Table 5.4

ASHRAE allowable environmental operating ranges	Points
Class A2;	1~~X~~
Or Class A3;	3~~X~~
Or Class A4	6~~X~~

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5.3.4 Logged Server Activity Metrics (*JC Straw Balloted June 2014)*
Product shall have the capability to log the following metrics in Table 5.5:

Table 5.5

Logged Metrics	Points
• Total system power draw (watts); and • CPU percent utilization (% of maximum CPU utilization); and • Server inlet temperature (degrees Celsius)	1
• Physical memory utilization (% total); and • Network utilization (% total bandwidth); and • Disk I/O usage (% total bandwidth)	1

This capability shall be enabled in the default configuration and shall perform its measurements, processing, logging and file management automatically – enabled by default as shipped. Data shall be accessible by the user with appropriate authority.

Data acquisition and format shall be consistent with Annex C.

6 Substances of Concern

6.1 Prerequisites

6.1.1 Conformance ~~Compliance~~ with European Union RoHS Directive (*JC Straw Balloted June 2014)*
The product shall meet the substance restriction requirements of the European Union RoHS Directive. All exemptions to the substances restrictions as defined by the Directive are applicable.

Demonstration of conformity to this requirement shall include documentation as required by the EU RoHS Directive including the technical documentation[2] and declaration of conformity.

6.1.2 Conformance~~Compliance~~ with European Union Battery Directive (*JC Straw Balloted June 2014)*
Batteries in the product shall meet the substance restriction requirements of the European Battery Directive.

"Not Applicable" may be declared ~~on the Product Registry by manufacturer~~ if the product does not contain batteries.

[2] Technical documentation can be generated per standard EN 50581 or equivalent; the EU Commission has identified EN 50581 as a harmonized standard for EU RoHS technical documentation.

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6.1.3 Inventory of Declarable Substances (*JC Straw Balloted June 2014)*
Manufacturer shall inventory the presence of IEC 62474 declarable substance groups and declarable substances in the product at or above the reporting threshold amounts stated in the IEC 62474 standard, using the version of IEC 62474 which is current at the time the product is declared to conform to this standard. The inventory shall include all declarable substance groups and declarable substances designated criteria 1, 2 and 3 of IEC 62474.

The manufacturer shall have an effective supply chain management process to manage, maintain, and update all data received on declarable substances. The manufacturer shall provide documentation 1) of the process to collect and manage the data; and 2) of a process to keep the data current. ~~During verification, the documentation shall contain the CAS number for each declarable substance (not including declarable substance groups).~~

6.1.4 Reduction of Bromine and Chlorine Content of Plastic Parts > 25 Grams
~~Plastic parts exceeding 25 g shall contain a maximum of 1000 ppm chlorine and a maximum of 1000 ppm bromine. Parts which exceed 25% postconsumer recycled content may contain a maximum of 3000 ppm chlorine and a maximum of 3000 ppm bromine.~~

~~"Not Applicable" may be declared on the Product Registry by manufacturer if the product does not contain plastic parts > 25 g~~.

If the product contains any plastic parts exceeding 25 grams which contain greater than 1000 ppm chlorine or greater than 1000 ppm bromine[3] as determined by test method EN 14582, the manufacturer shall conduct an alternatives assessment on the substance(s) responsible for the observed bromine and/or chlorine levels in accordance with criterion 6.3.4. Parts which exceed 25% postconsumer recycled content may contain a maximum of 3000 ppm chlorine and a maximum of 3000 ppm bromine before an alternative assessment is required.

Manufacturer shall provide documentation that any plastic parts in the product exceeding 25 grams contain less than 1000 ppm chlorine and less than 1000 ppm bromine, or contain greater than 25% recycled content and up to 3000 ppm chlorine and up to 3000 ppm bromine, or shall provide the required documentation stated in criterion 6.3.4.

"Not Applicable" may be declared if the product does not contain plastic parts > 25 g.

[3] Based on chlorine and bromine thresholds specified in IEC 62474 Material declaration for products of and for the electrotechnical industry

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6.2 Further Reduction of Substances of Concern (Optional)

6.2.1 Further Reduction of Lead - Elimination of Specified Lead Exemptions (*JC Straw Balloted October 2014)*
The product shall not utilize European Union RoHS Directive lead exemptions as listed below in Table 6.1.

Table 6.1

Lead Exemption	Points
Lead exemptions 6a, 6b, 6c, and 7b	1~~X~~ point(s)
Any lead exemptions	2~~Y~~ point(s)

~~**6.2.2 Further Reduction of Bromine and Chlorine Content**~~
~~The product shall meet the bromine and chlorine restrictions of IEC 61249-2-21 with a maximum of 900 ppm chlorine and a maximum of 900 ppm bromine and a combined maximum of 1500 ppm for:~~

~~**Table 6.2**~~

~~Plastic Parts~~	~~Points~~
~~Printed circuit boards only~~	~~1~~
~~All plastic materials in the product~~	~~2~~

6.2.2~~3~~ Reduction of Substances on the European Union REACH Regulation Candidate List of Substances of Very High Concern (*JC Straw Balloted June 2014)*
The product shall not contain substances on the Candidate List of Substances of Very High Concern (SVHC) above 0.1% weight by weight per "article", as per Article 33 paragraph 1 of the REACH Regulation and interpreted according to the European Chemicals Agency "Guidance on requirements for substances in articles." All SVHCs with a *Date of inclusion* 1 year or more before the product is declared to conform to this criterion are subject to this requirement.

Manufacturer shall document that a supply chain management system, which may include supplier management and grading procedures, material declaration and disclosure, as well as analytical testing, is used to ensure that the product does not contain these substances.

Candidate List of Substances of Very High Concern: http://echa.europa.eu/web/guest/candidate-list-table.

Point value: 1

6.3 Supply Chain Management of Substances of Concern (Optional)

6.3.1 Disclosure of Declarable Substances (*JC Straw Balloted June 2014)*
Manufacturer shall make publicly available on their website~~, and provide a link with the product specification,~~ the inventory generated for conformance with Criterion 6.1.3. The inventory shall contain

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the CAS number for each declarable substance (not including declarable substance groups). The link to the inventory shall be placed on the product specification or documentation web page. The manufacturer shall declare the URL of the public disclosure.

The product specification or documentation means the product marketing details of key parametric information, such as, but not limited to, number of CPUs, amount of memory, number of internal disk drives, I/O bandwidth, and enclosure dimensions.

Point value: 1

6.3.2 Requesting Full Substance Inventory

The manufacturer shall have a record of having requested from suppliers (or otherwise have access to) a complete list of the substances (full substance/material declaration) including their individual mass and CAS numbers in each item that may be assembled into the product.

The manufacturer shall also have a process and a database, either in-house or through a third party service provider, to manage and maintain all data received. The manufacturer shall provide documentation of the process to:

1) Collect and manage the data
2) Keep the database current for the active bill of materials (BOM), including a policy for:
    a. notification of material changes or supplier changes; and
    b. suppliers to resubmit data every 2 years
3) Demonstrate the database system's ability to manage detailed substance-level disclosure information, and
4) Demonstrate the database's ability to record and sum the collected information to enable metric calculation of the supplier information that has been received, as is relevant to 6.3.3, including the percentage mass of the covered product, or the percentage of unique parts for the covered product.

The intent of this criterion is to demonstrate that the manufacturer has made a good faith effort to obtain full substance inventory from their suppliers.

Note 1: For items that are multi-sourced (i.e. have multiple approved manufacturer part numbers) the reference to "each item that may be assembled into the product" includes all approved manufacturer part numbers.

Note 2: "each item that may be assembled into the product" includes materials that may be added during assembly such as lubricants and adhesives.

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Note 3: "Request" means either the manufacturer, or agent, or supplier of the manufacturer, has requested this information in writing from the supplier and has a documented response from the supplier representative, or has a contractual agreement between the manufacturer and the supplier that requires the supplier to provide this information.

Point value: 2

6.3.3 Acquiring Substance Inventory

The manufacturer shall demonstrate that it has in the database per 6.3.2 a complete list of the substances in the products/components supplied to the manufacturer, down to the part level, from its suppliers as specified in the table below. This requirement allows for up to 5% by mass, per part, of the substances to not be reported if they are confidential business information.

Conformity to this criterion shall be demonstrated based on the approved manufacturer parts (unique parts) for which the manufacturer has a complete list of the substances as compared to all approved manufacturer parts on the product bill of materials. A combination of the following metrics shall be used (both metrics need to be met to receive the points):

- Percentage of mass of the parts for which the manufacturer has a complete list of the substances; and
- Percentage of unique parts for which the manufacturer has a complete list of the substances.

Table 6.x

Data Acquired on Substance Inventory **% mass and % of approved unique parts on bill of materials**	**Points**
Minimum of 70% of total mass and minimum of 50% of unique parts	1
Minimum of 85% of total mass and minimum of 65% of unique parts	2
Minimum of 95% of total mass and minimum of 80% of unique parts	4
Minimum of 99% of total mass and minimum 95% of unique parts	6

The manufacturer has a system for validating reports or other substance ingredient declarations from its suppliers.

6.3.4 Alternatives Assessment

Manufacturer shall document that it or a supplier or a third party has performed an alternatives assessment on at least one substance of concern included in the product or manufacturing process. The substance shall be listed in the "Declarable Substances List" (Table A) of IEC 62474, Material Declaration for Products of and for the Electro-technical Industry or listed as a carcinogen, mutagen, reproductive toxicant, persistent, bioaccumulative, and toxic (PBT) substance, or endocrine disruptor in the lists in Annex D of this standard. Manufacturer shall consider exposure and risk throughout the lifecycle as part of the substance selection process.

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This assessment shall be performed consistent with one of the following frameworks: ***(TG will revisit and refine this list in the fall)***

- Interstate Chemicals Clearinghouse *Alternatives Assessment Guide*, Hybrid or Sequential Frameworks (www.newmoa.org/prevention/ic2/IC2_AA_Guide-Version_1.pdf)
- California Safer Products regulations–CA Code of Regulations Title 22, Division 4.5, Chapter 55 Article 5, Sections 69505.5-69505.7 (dtsc.ca.gov/LawsRegsPolicies/Regs/upload/SCP-Final-Regs-Text-10-01-2013.pdf) ***(Need to confirm referencing once guidance is published)***
- Report of the National Academies of Science project "Design and Evaluation of Safer Chemical Substitutions – A Framework to Inform Government and Industry Decisions" (***expected August 2014 – need to confirm referencing once published)***

An alternative assessment performed on a substance application from a prior-shipped product is considered sufficient if the application is demonstrated to be relevant to the product to which this standard is being applied.

Manufacturer documentation of the alternatives assessment shall include:

- Framework used
- Date of completion of the assessment; the assessment shall have been completed no more than one year prior to the date the product is declared to conform to this criterion
- Substances evaluated
- Which of the following outcomes resulted from their alternative assessment:
    - A safer alternative was identified and used as the substitute for the original substance, or
    - The original substance is determined to be safer than, or as safe as, the evaluated potential alternative, or
    - A safer alternative was identified but is not commercially or technically viable for that application per the requirements of the framework used, or
    - The need for the function provided by the substance was eliminated.

In the case of an assessment done as part of a partnership or industry consortium, the other participating parties shall be named.

An alternatives assessment performed under 6.1.4 shall not be eligible for this optional criterion.

Point value: 3

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6.3.5 Making Alternatives Assessment Publicly Available
The manufacturer shall publicly disclose the documentation required for conformance with criterion 6.3.4 and provide a list of criteria and weighting used in the alternatives assessment by either:

- Posting on a publically accessible database such as the Substitution Support Portal (SUBSPORT)[4] or the IC2 Database[5], or
- Making the documentation accessible on the manufacturer's website.

The manufacturer shall declare the URL of the public disclosure.

Point value: 1

7 Preferable Materials Use

7.1 Prerequisites

7.1.1 External Enclosure (Casing) (*JC Straw Balloted June and October 2014)*
External enclosure (casing) shall consist of one or more of the following materials as separable parts:

- steel or aluminum alloys, or
- plastic containing a minimum of 20% postconsumer recycled (PCR) plastic, or
- a material demonstrated to have lower environmental impact than those listed above based on an LCA conducted in accordance with Criterion ~~XXX~~11.2.1

Manufacturer shall declare the materials used in the enclosure. If plastic, manufacturer shall demonstrate conformance by providing a supplier letter stating the following: minimum percentage of PCR ~~postconsumer recycled~~ plastic in the materials supplied to the manufacturer or to the manufacturer's part supplier. If steel or aluminum alloys, no recycled content documentation is required.

7.1.2 Disclosure of Postconsumer Recycled Material *(JC Straw Balloted June 2014)*
Manufacturer shall declare on the Product Registry the minimum percentage by weight of postconsumer recycled material in the product. The following equation shall be used to calculate the percentage:

$$\frac{\text{postconsumer recycled material by weight}}{\text{total material by weight less exclusions}} \times 100 = \quad \% \text{ postconsumer recycled content}$$

In the calculation:

[4] http://www.subsport.eu/about-the-portal
[5] http://www.newmoa.org/prevention/ic2/projects/resource/hazassesstool.cfm

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- Parts < 25 g and printed circuit board assemblies may be excluded.
- Only material derived from postconsumer recycled feedstock shall be included in the numerator.
- Additives and fillers that are not derived from postconsumer recycled feedstock shall not be included in the numerator.
- Additives and fillers used in material shall be included in the denominator.

The entire weight of the product, less exclusions, shall be included in the denominator. Manufacturer may choose not to calculate the postconsumer recycled content of individual components, parts or the entire product. If the manufacturer chooses not to calculate the postconsumer recycled content, "unknown" shall be declared. If "0" or "unknown" is declared for the entire product, manufacturer cannot claim optional points in Section 7.2 of this standard.

7.2 Recycled Content (Optional)

7.2.1 Postconsumer Recycled Plastic Content *(JC Straw Balloted June 2014)*
The use of PCR ~~postconsumer recycled plastic~~ material in the product, including ~~(excluding~~ the external enclosure,~~)~~ shall be awarded ~~optional~~ points according to Table 7.2. Manufacturer may claim one point for each achievement listed in the table.

Table 7.2

Postconsumer Recycled ~~Plastic~~ Content	**Points**
≥ 10% PCR plastic	1
≥ ~~30~~ 25 % PCR plastic	~~2~~ 1
≥25% PCR metal	1
≥10 % derived WEEE plastic	1
Demonstrated conformity with a material traceability standard*	1

The following equation shall be used to calculate the percentage:

$$\frac{\text{PCR ~~postconsumer recycled plastic~~ material by weight}}{\text{total ~~plastic~~ material by weight less exclusions}} \times 100 = \%\ \text{PCR ~~postconsumer recycled plastic~~ content}$$

In the calculation:

- Parts < 25 g and printed circuit board assemblies may be excluded.
- Only material derived from PCR feedstock shall be included in the numerator.

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- Additives and fillers that are not derived from PCR feedstock shall not be included in the numerator.
- Additives and fillers used in material shall be included in the denominator.

For all points claimed, documentation shall include:

- a list of plastic and, or metal parts ≥ 25 g, weight of each ~~plastic~~ part and percentage PCR ~~postconsumer recycled~~ content (see Annex E~~D~~ for an example template)
- A letter from the supplier of the material stating the origin(s) of PCR material, and the minimum percentage of PCR content supplied to the manufacturer or manufacturer's fabricated parts supplier. Information on origin of materials (e.g., material type/form, product type, sourcing) shall be sufficient to demonstrate that materials are traceable to postconsumer sources.

  *Including DIN EN 15343:2008-02 or UL 746D that demonstrate a system for material-identity and quality control of PCR content.

~~"Not Applicable" may be declared on the Product Registry by manufacturer if the product does not contain plastic parts > 25 g.~~ The weight of all parts and components for a material, less exclusions, shall be in the product weight. Manufacturer may choose not to calculate the PCR content of individual components and parts.

7.2.2 Postconsumer Recycled Content of Rare Earth Elements

Product shall contain a hard drive with an actuator/voice coil or spindle magnets which contain 5% or more PCR content neodymium or dysprosium by weight of the magnet. The neodymium or dysprosium shall be provided through the recycling of magnets from used devices. Manufacturer shall provide documentation from the disk drive supplier confirming that the product contains a hard drive with 5% or more PCR content neodymium or dysprosium.

7.3 Material Efficiency/Dematerialization (Optional)

7.3.1. Reduction of Surplus Parts by Default (*JC Straw Balloted October 2014)*

The manufacturer shall document and implement a customization program to reduce surplus parts. The program shall identify the minimal product configuration, as determined by the manufacturer and outlined below:

- Keyboards/mice – zero by default; 1 keyboard and/or 1 mouse as options. Indicate connector required (e.g. PS/2, USB, specific).
- Power cables (where appropriate) – zero by default; 1 for each power supply as option.
- Mounting hardware – zero by default; specific mounting hardware as an option.
- Documentation and advertising – zero by default; 1 per server type in order as option.
- Installation media – zero by default; 1 per server type in order as option.

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- Cosmetic blanks/dummies – option of not receiving un-required parts.
- Fans – include option of ordering minimum as determined by manufacturer.

The manufacturer shall declare whether there is additional cost to the purchaser for the above customization options.

X point(s)

8 Product Packaging

8.1 Prerequisites

8.1.1 Elimination of Substances of Concern in Product Packaging *(JC Straw Balloted June 2014)*
Product packaging shall not contain lead, mercury, cadmium or hexavalent chromium above 100 ppm total for the four metals combined in any packaging component in accordance with the European Union Packaging Directive and the Model Toxics in Packaging Legislation.

8.1.2 ~~Recyclable~~ Enhancing Recyclability of Packaging Materials
Product packaging shall meet the following requirements ~~to enhance recyclability.~~

- All non-reusable packaging components ≥ ~~>~~25 g shall be separable ~~into recyclable~~ by material type ~~streams~~, including plastic material type specified below, without the use of tools, with the exception of labels affixed to plastics bags or wraps, staples, and nails in pallets.
- All plastics ≥ ~~>~~25 g shall be clearly marked with material type in accordance with ISO 11469/1043, ASTM D7611/D7611M, ~~SPI resin identification code,~~ or DIN, with the exception of plastic films ~~or stretch wrap~~.

8.1.3 Total Recycled Fiber Content in Packaging
Fiber-based packaging materials shall contain the minimum total recycled fiber content shown in Table 8.1. In their packaging specifications, manufacturers shall give preference to the maximum postconsumer fiber content.

"Not Applicable" may be declared ~~on the Product Registry by manufacturer~~ if the product packaging does not contain fiber-based packaging.

Table 8.1

Packaging Category	Percentage Postconsumer Recycled Fiber (by weight)	Percentage Total Recycled Fiber (by weight)
Corrugated containers:		
- <300 psi	25-50	25-50
- 300 psi	25-30	25-30

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Solid Fiber Boxes	40	40
Folding Cartons	40-80	100
Industrial paperboard (e.g., tubes, cores, drums, and cans)	45-100	100
Miscellaneous (e.g., pad backs, mailing tubes, protective packaging)	75-100	90-100
Padded mailers	5-15	5-15
Carrierboard	10-15	10-100
Brown papers (e.g., wrapping paper and bags)	5-20	5-40

Source: US EPA's Recommended Recovered Fiber Content Levels for Paperboard and Packaging Products, http://www.epa.gov/epawaste/conserve/tools/cpg/products/paperproducts.htm#paperboard

8.1.4 Elimination of Individual Packaging for Hardware and Components *(JC Straw Balloted June 2014)*
All hardware and components required for normal operation of the server (and shipped with the product) shall be shipped inside the server. Exceptions are components and accessories normally used external to the server such as power cords, keyboard, or mounting rails. No hardware shall be shipped in individual or separate packaging either within the packaging container or within the server product.

8.1.5 Elimination of Chlorine in Processing Packaging Materials
Manufacturer shall confirm with a supplier letter that any fiber used in packaging was not bleached with chlorine compounds. This requirement applies to the bleaching of fiber materials (including recovered fiber) and their fabrication into packaging for server products declared to conform to this standard, and not to prior uses of the fiber.

8.2 Compostable, Recyclable and Reusable Packaging (Optional)

~~**8.2.1 Compostable, Recyclable and/or Reusable Packaging**~~
~~Packaging materials for the product shall be either compostable and/or recyclable as defined in Normative Annex E. Points shall be awarded in accordance with Table 8.2.~~

~~For reusable packaging, this criterion may be met by manufacturers operating a returnable packaging system that demonstrates that the product packaging is reused at least 5 times. Points shall be awarded based on the percentage of all packaging materials reused within the returnable packaging system in accordance with Table 8.2. Packaging components include all crates, pallets, fiber-based materials, foams, plastic bags, wraps and films, strapping, etc.~~

~~**Table 8.2**~~

~~**Percentage Compostable/ Recyclable/Reusable Packaging (by weight)**~~	~~**Points**~~
~~≥ 90 %~~	~~1~~
~~≥ 99 %~~	~~2~~

~~This criterion may be declared differently by region or country.~~

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9 Design for Repair, Reuse and Recycling

9.1 Prerequisites

9.1.1 Design for Repair, Reuse and Recycling *(JC Straw Balloted June 2014)*
The product shall be designed with the following features to facilitate repair, preparation for reuse, recycling, and safe handling.

- External enclosures shall be removable by hand without destruction of the enclosure or with commonly available tools.
- Components with special handling needs listed in Annex VII of the European WEEE Directive 2012/19/EU shall be identified, accessible, and removable by hand or with commonly available tools.
- At a minimum, if present in the product data drives or cards, processor, memory DIMMs, power supply, fans and I/O cards – shall be accessible and replaceable by hand or with commonly available tools.
- Wires and cables that connect to external sources of power or data shall be removable from all products by hand or with commonly available tools without either the cable or the component being rendered unusable, unless required for technical or safety reasons.

In order for a component to be considered "accessible" for the purposes of this criterion it shall, following removal of the enclosure, be visible without removal of other components and shall be removable without having to remove more than one or two other components. The removal referred to in this paragraph shall be non-destructive.

In order for a component to be considered "identified" for the purposes of this criterion either the component shall be called out in the product disassembly report called for in prerequisite 9.1.4 or marked with a visual display as called for in 9.3.1.

9.1.2 Design for Plastics Recycling (*JC Straw Balloted October 2014)*
All plastic parts >100 g shall meet the following requirements:

- Clearly marked with material type in accordance with ISO 11469/1043, with the exception of printed circuit boards, wire and cables.
- Separable by hand or with commonly available tools, such that plastic parts could be separated into parts with the same material type.

"Not Applicable" may be declared ~~by manufacturer~~ if the product does not contain plastic parts weighing >100 g.

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Note: For components containing plastic parts, the 100g threshold applies to the plastic part only.

9.1.3 Product Recyclability Calculation and Minimum 90% Recyclability Rate

~~The product shall have a recyclability rate of at least 90% using technology and processes available at the time of product declaration or verification. The calculation of recyclability rate shall utilize the methodology in IEC/TR 62635 (see Annex E of IEC/TR 62635 for a calculation template).~~

Manufacturer shall perform a calculation for the recyclability of the product using the IEC TR62635 methodology, and shall make the assumptions, methodology and calculation results publicly available and readily accessible on their web site. A link to that information shall be declared.

The product shall have a minimum recyclability rate of 90% by weight and based on technology and processes available at the time the product is declared to conform to this Standard.

Determination of the recyclability rate shall start with the receipt of the untreated waste equipment (if beyond re-use) and end when the end-of-waste status for fractions is achieved. Circuit board substrate material, included in circuit boards that will be sent to a smelter for metals recycling, shall be considered recyclable for the purpose of the calculation.

The methodology shall identify the recycling technologies and practices that are sufficient for achieving the claimed recyclability rate. These technologies and practices must be common in existing recycling systems, though they need not be available everywhere or throughout the world. Also, the methodology shall identify the information about the product from the manufacturer which would be needed by a treatment operator in order to achieve the claimed rates.

9.1.4 Information and ~~Product Disassembly~~ Reporting in Preparation for Re-use and Recycling (Prerequisite for Silver and Gold)

~~Manufacturer shall provide the following information on a publicly accessible website to facilitate product disassembly and safe handling of the product:~~

- ~~A disassembly or end of life characterization report that demonstrates conformity to all the prerequisites in Section 9.1.~~
- ~~List of components with special handling needs identified in the European WEEE Directive 2012/19/EU, the location of these components in the product, and guidance for the identification and safe removal of these components.~~

~~The information shall be made public within one year of first market release of the product in any region or country. Manufacturer shall declare on the Product Registry the date of market release at the time of product registration. The URL where the above required information is located shall be declared no later than one year after the declared date of market release.~~

The manufacturer shall publish a "manual" for third party re-use and recycling organizations, in at least English, with the information listed below, including the same information as provided by the manufacturer for use by its technicians for the same purposes as follows:

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- Manual shall be available on a publically accessible website without restriction for access. The manufacturer shall declare the URL of the public disclosure.
- The manual shall be published in any region or country and the manufacturer shall have a written procedure that makes the manual publically available for a minimum of 7 years following the end of production of the product.

The manual shall contain the following information about preparation for re-use and recycling:

- The different EEE components and materials; and
- The location of materials with special handling needs as identified in WEEE Directive 2012/19/EU Annex VII ; and
- Technical reference of each individual sub-assembly providing pin diagram and make and model of each connector capable of being field terminated as provided to manufacturer repair/authorized service centers; and
- The components that cannot be replaced by non-manufacturer supplied components; and
- An updated list, at least annually, of any components provided by the manufacturer that are compatible or equivalent with original components; and
- A disassembly or end of life characterization report that demonstrates conformity to all the prerequisites in Section 9.1 and includes, at a minimum, step-by-step disassembly instructions with required tools, product specifications and troubleshooting information.
- The function specified in the manufacturer's user manual, repair manual or technical manual should be used to determine original intended function, and to assist with the preparation for re-use or treatment operations.

The manual shall meet the following formatting requirements:

- Available in user-friendly formatting on the web and as downloadable PDFs for offline viewing; and
- Available in machine-friendly file format: either XML or oManual/IEEE 1874 – IEEE Standard for Documentation Schema for Repair and Assembly of Electronic Devices; and
- Provided under an open-source license that allows redistribution and modification such as Creative Commons (www.creativecommons.org) (CC-BY).

9.1.5 Functionality Testing Software Tools *(JC Straw Balloted October 2014)*

The manufacturer shall make publically available and readily accessible, and provide access to the necessary hardware functionality testing software tools and applicable updates to ensure the product meets operating specifications and can be returned to service as provided by the manufacturer's repair/authorized service centers. Manufacturer shall also make available and provide access to any system or peripheral firmware (BIOS, etc.) and drivers for the server hardware.

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The manufacturer shall have a written procedure that makes all of these items available for a minimum of 7 years following the end of production of the product and identifies if there is a cost. The manufacturer shall declare if there will be any cost associated with the provision of the functionality testing software tool.

The manufacturer shall declare the URL of the public disclosure.

9.1.6 Informing Reuse Operators and Treatment Operators of Information Available for their Assistance (Corporate)

Manufacturers shall inform reuse operators and treatment operators with which they, or an organization working on their behalf, have a business relationship for providing end-of-service/end-of-life management of the products declared to this standard regarding the availability of the information provided under any of the following criteria to which they declare conformance: 9.1.4, 9.3.1, and 9.5.1. The method of informing reuse operators and treatment operators shall be in writing and shall be demonstrated by provision of the distributed written document and a record of its distribution.

9.2 Design for Plastics Recycling (Optional)

9.2.1~~2~~ Reduction of Materials Incompatible with Recycling ~~Plastics Separable from Metals~~

Plastic parts >100 g, ~~shall not contain molded, glued or otherwise attached metal inserts or metal fasteners, unless the metal component can be snapped off manually or removed with commonly available tools.~~ with the exception of printed circuit boards, wire and cables, shall not have:

- Molded, glued or otherwise attached metal inserts or metal fasteners, unless the metal component can be completely snapped off manually or entirely removed with commonly available tools.
- Adhesives, coatings, paints, or finishes that have a significant impact on the physical or mechanical properties of the plastic when it is recycled. This shall be demonstrated by either:
    - Test results showing no more than a 25% reduction in either the notched Izod impact at room temperature between a test sample made from the original plastic without adhesives, coatings, paints, or finishes and test sample made from the plastic with adhesives, coatings, paints, or finishes, as measured using ASTM D256 or ISO 180, or the Charpy impact for the same test samples as measured using ISO 179; or
    - Peer reviewed published literature concluding no significant impact.

"Not Applicable" may be declared ~~by manufacturer~~ if the product does not contain plastic parts weighing >100 g.

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9.3 Identification of Components with Special Handling Needs (Optional)

9.3.1 Product Marked to Identify Components and Materials with Special Handling Needs *(JC Straw Balloted June and October 2014)*

The product shall visually display information on the presence and location of all components and materials with special handling needs as identified in the European WEEE Directive 2012/19/EU Annex VII. The information shall be provided on a label or other permanent marking located on the product itself or visible upon removal of the external housing in order to clearly identify the presence before any treatment. The label, or permanent marking, shall contain a QR code, linked to the required information, and is not required to be co-located with other labels.

Products that contain no components with special handling needs as identified in the European WEEE Directive 2012/19/EU Annex VII may claim this point. A label or other permanent marking located on the product itself shall indicate the absence of components with special handling needs.

9.4 Recyclability Rate Calculation

9.4.1 Consultation for Recyclability Rate Calculation

The manufacturer shall conduct a consultation, during the design phase for the product declared to conform to this standard, with a treatment operator that is certified to a standard per criterion 12.1.2.

The consultation shall result in a report that is publically available on the manufacturer website that (2 points):

- Provides a recyclability rate calculation of the product utilizing the procedures of criterion 9.1.3 and the guidelines provided in IEC TR 62635.
- Documents the recyclability rate of the product per Annex E of IEC TR 62635.
- Information from the treatment operator included in the example in section D.3 of Annex D of IEC TR 62635 regarding the process and the predicted recyclability rate of each material in the product. Circuit boards destined to be sent to a smelter shall be reported as a single recyclable material. The report need not document the recovery rate.

For additional optional points:

- The report shall also document the time that the recycler estimates will be necessary to liberate and process each material from the product into a secondary commodity for which there is a market. (1 point)
- The report shall include information and concepts developed during the consultation that will influence the future design choices of similar and/or the next generation of the product. (1 point)

The manufacturer shall declare the URL of the public disclosure.

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Note: The consultation may also include an eco-design consultant.

Point value: maximum 4

9.5 Rare Earth Recovery and Recycling (Optional)

9.5.1 Information and Reporting on Disk Drive Magnet Type and Location
The manufacturer shall indicate the type of actuator/voice coil and spindle magnets in the product's hard disk drive on the external casing of the hard disk drive by means of a QR code. The QR code shall link directly to the magnet type and location information on a publically available database or the manufacturer's web site in at least English.

The QR code shall be printed in black on a white background if one or more of the magnets contain Neodymium. The magnet type shall be identified as Neodymium iron boron. The QR code shall include a non-machine readable chemical symbol (Nd) (see Annex F).

In the case that neither magnet contains Neodymium, the QR code shall be printed in red on a white background (see Annex F).

The voice coil and the spindle magnet locations in the hard disk drive shall be identified by metric measurements from the edges of the disk drive.

10 Product Longevity

10.1 Prerequisites

~~**10.1.1 Service Agreement or Warranty**~~
~~The manufacturer shall offer a minimum three year service agreement or warranty for the product.~~

10.1.1~~2~~ Replacement Components ~~Parts~~ Availability
Product replacement components ~~parts~~ and/or product service shall be made available through the manufacturer or an authorized third party for at least ~~five~~ 5 years after the product is first placed on the market ~~end of production~~.

Replacement components ~~parts~~ shall include, at a minimum, power supplies, fans, hard drives, memory, processors and printed circuit boards ~~motherboards (*need discussion of this list)*~~. Information regarding the availability of product replacement components ~~parts~~ and/or product service shall be publicly available on the manufacturer's website. The manufacturer shall declare the URL of the public disclosure.

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~~**10.2 Upgradeability (Optional)**~~

~~**10.2.1 Upgradeability/Capability Enhancement**~~
~~The product shall be designed for upgradeability or capability enhancement for, at a minimum, hard drives, PCIe adapters, memory, and processors (*need discussion on this list*). These options shall be able to be installed by hand or with commonly available tools.~~

11 Life Cycle Assessment and Greenhouse Gas Emissions

11.1 Prerequisites
None

11.2 Product Life Cycle Assessment (Optional)

11.2.1 Conduct Life Cycle Assessment *(JC Straw Balloted June and October 2014)*
The manufacturer shall conduct a life cycle assessment (LCA) of the product declared to this standard in accordance with ISO 14040/14044. The LCA shall include all life-cycle stages (see Annex G~~F~~) from the product life-cycle, from extraction of raw materials through end-of-life (i.e. cradle to grave), and shall address, at a minimum, the following impact assessment categories using either U.S. EPA TRACI 2.1[6], or CML 2001 (Nov 09)[7] , or ILCD 2011[8] impact assessment methodologies:

1. Global warming potential (GWP 100 years)
2. Acidification potential (AP)
3. Photochemical ozone creation potential (POCP, or "Smog")
4. Eutrophication potential (EP)
5. Ozone depletion potential (ODP)
6. Abiotic depletion potential (ADP)- or fossil fuels depletion when using TRACI

To qualify under this criterion, the LCA must have been reviewed in accordance with ISO 14044 Section 6.1 by an independent third party external to the manufacturer, and must have been conducted no more than 3 years prior to product registration or certification. The LCA may be conducted on a group of products, but the declared product shall be listed on the LCA.

A new LCA will be required if:

[6] US EPA, Tool for the Reduction and Assessment of Chemical and other Environmental Impacts (http://www.epa.gov/nrmrl/std/sab/traci/)
[7] University of Leiden Institute of Environmental Sciences (CML), Handbook on LCA (http://cml.leiden.edu)
[8] ICLD 2011- Recommendation

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- The previously submitted LCA is greater than 5 years old or
- Changes have been made to the product manufacturing or design and a sensitivity analysis indicates that those changes have resulted in a significant difference. A significant difference is when there have been changes or updates in the product that resulted in a change in environmental performance of the product entailing either an increase or decrease of 10% or more on any one of the impact assessment categories from the list above.

11.2.2 Public Disclosure of LCA Results

The LCA produced in 11.2.1 shall be made available to the public on the manufacturer's website using one of the following documents:

1. Third party report of the LCA as defined in Section 5.2 of ISO 14044; or
2. Environmental Product Declaration (EPD) Type III label in accordance with ISO 14025.

This criterion may be satisfied by the manufacturer providing a link on its website to another publicly accessible website. The manufacturer shall declare the URL of the public disclosure.

11.2.3 Public Disclosure of LCA Inventory Data

The LCA inventory data for the entire product system utilized to produce the LCA in 11.2.1 shall be made publicly available. Data shall include both primary and secondary data used in the LCA, as modeled. To qualify, all data disclosures under this criterion must align and be consistent with the LCA conducted in 11.2.1.

Disclosure of inventory data shall be made using one of the following methods (1 point):

1. Publication of the life cycle inventory in a peer reviewed journal (e.g. Journal of Cleaner Production or The International Journal of Life Cycle Assessment); or
2. Acceptance of the life cycle inventory by a national or international database. In such cases data shall be provided in Ecospold v.2[1] or ILCD[2] formats.

One additional point shall be awarded for either of the following qualifying data disclosures. Only one additional point may be claimed for this criterion.

1. Reporting of primary data used to characterize the manufacturing life-cycle stage of the product system. Primary inventory data include data that derive from and are specific to elementary or product flows; or
2. Reporting of inventory data representing scenarios for product disposal or reclamation at end-of-life. Scenarios must be fully documented in the LCA report, including all assumptions and sources of information upon which the data are based.

[1] Ecospold V.2 Data Format <http://www.ecoinvent.org/data-providers/how-to-submit-data/ecospold2/>

[2] International Life Cycle Data System <http://eplca.jrc.ec.europa.eu/?page_id=134>

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The manufacturer shall declare the URL of the public disclosure.

Point value: maximum 2 points

11.3 Greenhouse Gas Emissions (Optional)

11.3.13 Reduce Fluorinated Greenhouse Gas/N_2O Emissions Resulting from Semiconductor Manufacturing *(JC Straw Balloted June 2014)*

The manufacturer shall declare that at least one supplier of CPUs and/or DRAM used in the product has installed abatement systems designed, operated, and maintained specifically to destroy or remove fluorinated greenhouse gases (F-GHGs) and nitrous oxide (N_2O) used in the manufacture of CPUs and/or DRAM. These systems shall be installed on all CPU and/or DRAM manufacturing tools to the maximum extent physically and technically feasible.[9] The intent of this criterion is to facilitate destruction or removal of F-GHG and N_2O emissions that result from CPU and/or DRAM manufacturing.

This declaration shall be supported with a letter provided by the CPU and/or DRAM supplier. Examples of F-GHGs include, but are not limited to, CF_4, C_2F_6, C_3F_8, c-C_4F_8, C_4F_8O, CHF_3, CH_2F_2, NF_3, and SF_6. To the extent that installing abatement is not feasible or where equally or more effective means of reducing emissions exist, manufacturers shall demonstrate implementation of such methods (e.g. use of alternatives) to reduce emissions to the extent possible.

The supplier letter shall assure the following:

- That abatement systems have been installed on all manufacturing tools that use F-GHG and N_2O (i.e., etching and cleaning tools) to the extent physically and technically feasible or the supplier has eliminated the use of F-GHG /N_2O in manufacturing. If abatement systems cannot be installed on all manufacturing tools, the letter shall:
    - Demonstrate why it is not possible to install abatement systems on all manufacturing tools.
    - Describe how the supplier reduced its F-GHG/N_2O emissions. For example, if the supplier's emissions reductions also resulted from the use of alternative gases, process optimization, and/or recovery and/or recycling, the use and impact of those strategies should be explained.
- That the supplier has worked with the abatement system provider to develop and adhere to company-specific operation and maintenance procedures and schedules.
- That the supplier has tested the abatement systems according to the EPA's Protocol for Measuring Destruction or Removal Efficiency (DRE) of Fluorinated Greenhouse Gas Abatement

[9] It may not be feasible to install control technologies on all manufacturing tools due to space limitations in the fab or sub fab, or other physical and technical restrictions.

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Equipment in Electronics Manufacturing (EPA DRE Protocol[10]) or other abatement system test procedures outlined in subpart I to ensure the systems are performing as intended.

- That the supplier has developed a GHG inventory of F-GHG and N_2O emissions associated with its CPU and/or DRAM manufacturing process (including fluorinated heat transfer fluids) expressed in tons of CO_2e using the 2006 IPCC Tier 2a, 2b or Tier 3 methodology or subpart I of EPA's GHG Reporting Rule. *(Place holder for definition of GHG inventory)*
- That the supplier publicly reports its GHG inventory of F-GHG and N_2O emissions.

12 Responsible End-of-Service/End of Life Management

12.1 Prerequisites

12.1.1 Product Take-back Service (Corporate) *(JC Straw Balloted June 2014)*
Manufacturer shall ensure provision of ~~provide~~, either directly or through a third party, a country-wide or region-wide take-back service to collect and process products declared ~~registered~~ and formerly declared to conform to this standard ~~registered products~~ for re-use-and~~/~~,or end-of-life management. Manufacturer shall offer ~~this~~ the take-back service option either directly or through its distribution channels ~~distributors~~ to the first customer; the customer may choose to utilize ~~this~~ the take-back service option or not.

The service shall incorporate a management hierarchy to promote the extended and best possible use of the equipment and components, in a manner that is protective of human health and the environment, as follows:

1. Re-use of whole equipment;
2. Re-use of components;
3. Recycling for material recovery;
4. Disposal of materials in energy recovery facilities and, or solid and hazardous landfill~~-~~facilities permitted in accordance with applicable legislation.

Notification of the take-back service, including how to utilize the service(s), shall be available in sales information and product documentation, including website-based sales information and user manuals in formats provided to customers (e.g., website, compact disc, hard copy) at the time of purchase/lease. The information shall be maintained and updated on the manufacturer's website. The manufacturer shall declare the URL of the public disclosure.

Manufacturer shall disclose both at the point of sale and the point of the take-back service if there will be any direct costs to the purchaser / lessee for the take-back service.

[10] http://www.epa.gov/semiconductor-pfc/documents/dre_protocol.pdf

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To demonstrate ~~compliance~~ conformance with this criterion, the manufacturer shall obtain and maintain objective evidence:

- Of the manufacturers' conformity with this criterion throughout the ~~sales chain~~ distribution channel to the first customer
- That the manufacturer offers the take-back service defined in this criterion for:
    - Customers in the country or region where the product is ~~registered~~ declared to conform to this standard; and
    - All types of selling technique (e.g. distance-selling or through distribution network)
- That the manufacturer notifies the purchaser/lessee of the availability of take-back services, that includes how to utilize the take-back service
- Of the manufacturers' compliance with national legislation/legal requirements and to confirm that compliant and environmentally sound management has been employed (to the criterion in 12.1.2) for the collection, transportation and processing (re-use, refurbishment or recycling, as applicable) and disposal of all products declared to conform to this standard ~~registered~~ and returned under this criterion.

In jurisdictions where there are existing laws and / or regulations specifically to collect, re-use and / or recycle products declared ~~registered~~ and formerly declared to conform to this standard ~~registered products~~, manufacturer's demonstration of compliance with these legal requirements will fulfill this requirement.

This criterion is applicable only in countries or regions for which the product is declared to conform to this standard.

12.1.2 End of Service/End of Life Management (Corporate) (*JC Straw Balloted October 2014)*
In jurisdictions where manufacturer can control the selection of the initial re-use or treatment operator, manufacturer shall ensure that all equipment and, or components (including lease returns, warranty returns, trade-ins) forming the whole or part of the product covered by criterion 12.1.1 are prepared for re-use and / or initially treated at a re-use or treatment facility, which is independently certified by an accredited certification body to one or more of the following recognized standards: The Responsible Recycling ("R2") Standard for Electronics Recyclers, the e-Stewards *Standard for Responsible Recycling and Reuse of Electronic Equipment,* the WEEELABEX Treatment Standard, or the CENELEC - EN 50625 'Collection, logistics & Treatment requirements for WEEE'. Certification bodies shall be accredited by an International Accreditation Forum member accreditation body (http://www.iaf.nu/) to certify to the specific standard identified.

The NSF Joint Committee on the Environmental Leadership Standard for Servers may add standards to the above list of recognized standards, provided the standard meets requirements a) through i) in criterion 4.6.1.2 of the IEEE 1680.2-2012 Standard for the Environmental Assessment of Imaging Equipment.

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These requirements apply to any products returned under 12.1.1 to any facility/operator whether owned by the manufacturer or an agent acting on behalf of the manufacturer.

To demonstrate conformance with this criterion, manufacturer shall provide valid certificates held by initial re-use or treatment facilities utilized at the time of product registration, and on an on-going basis (whether facilities are owned by manufacturer or an agent of manufacturer.)

This requirement is applicable only in countries or regions for which the product is declared to conform to this standard.

12.2 End of Life Management (Optional)

12.2.1 Publically Available Record of the Re-use / Recycling Achievement

Manufacturer shall make publically available on their web site the annual re-use and recycling and recovery achievements (as separate percentages of their annual total mass returned) of the take-back service for each country into which the product is declared to conform to this standard. This criterion applies only to equipment taken back under criteria 12.1.1. Equipment recovered and processed under national or regional collection schemes (mandated programs) may be included if the data is made available to the manufacturer.

Determination of the re-use and recycling and recovery achievements shall start with the receipt of the equipment or components through the take-back service and end:

- when the equipment has been prepared for re-use by a certified re-use operator as defined in criterion 12.1.2
- when output recycling fractions reach end-of-waste status , or;
- when output fractions have been dispatched to a waste to energy facility ; or
- when output fractions have been dispatched to a landfill facility for disposal.

The calculation of the recovery and recycling achievements shall include each of the following quantities, as relevant:

- equipment and components that have been prepared for re-use;
- fractions destined for recycling;
- fractions destined for energy recovery; and
- fractions destined for disposal by the certified treatment operator and all downstream operators.

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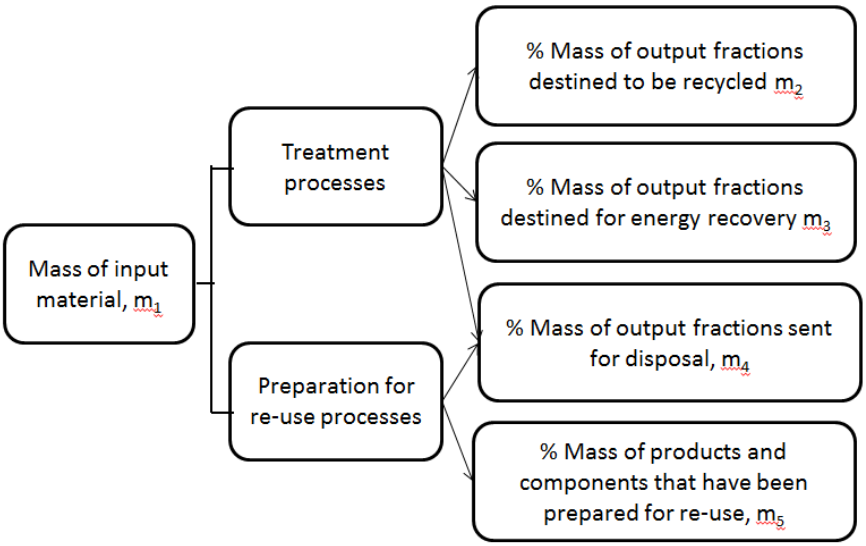
Figure x: Flow chart showing separate parts of the re-use and treatment process



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The total re-use achievement shall be calculated with reference to Figure x:

Re-use achievement: % rate = $\frac{M_5}{M_1}$

The total recycling achievement shall be calculated with reference to Figure x:

Recycling achievement: % rate = $\frac{M_2}{M_1}$

The total recovery achievement shall be calculated with reference to Figure x:

Recovery achievement: % rate = $\frac{M_2 + M_3}{M_1}$

To demonstrate compliance with this criterion, the manufacturer shall obtain and maintain objective evidence in the form of statements:

- of re-use from the initial certified re-use operator (percentage by weight to the mass of input equipment and / or components received for the preparation of re-use)
- of recycling from the initial certified treatment operator (percentage by weight to the mass of end-of-life equipment and / or components received).
- of recovery from the initial certified treatment operator (percentage by weight to the mass of end-of-life equipment and / or components received).

13 Corporate Environmental Responsibility

13.1 Prerequisites

13.1.1 Environmental Management System (EMS) (Corporate)

Manufacturer shall have formal, self-declared, EMS for those parts of the company that have significant responsibility for the design and manufacturer of all products declared to conform to this standard. The EMS shall meet the requirements of ISO 14001. Certification to either ISO 14001 or EMAS (EU Eco-Management and Audit Scheme) meets this requirement.

~~**13.1.2 Environmental Reporting (Corporate)**~~

~~Manufacturer shall publicly report the EMAS Key Performance Indicators annually associated with the company's operations. Manufacturer may report for either the entire company level or for those parts of the company that have significant responsibility for the design and manufacturer of all products~~

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~~declared to conform to this standard. The annual reporting shall include goals, targets and objectives for the current year, and the previous year. Performance against these goals and targets shall be included for the previous year.~~

~~Annual public reporting shall include at least two annual public disclosures or documentation of a program to collect data on an annual basis. The option to provide documentation of a data collection program is available only for the initial two years the manufacturer declares products to conform to this standard. Manufacturer's website shall either provide the annual disclosure or a link to a public repository containing the disclosure.~~

13.1.2~~3~~ Public Disclosure of Use of Conflict Minerals in Products (Corporate) (Prerequisite)
(placeholder for criterion) (JC Straw Balloted June 2014)
Manufacturers shall:

- Determine whether any of their products that they manufactured or contracted to have manufactured contain conflict minerals that are necessary to the functionality or production of those products and prepare disclosures on use and sources of these minerals in conformance with Rule 13p-1 under the U.S. Securities Exchange Act of 1934, and
- Make such disclosures available on their public websites. The manufacturer shall declare the URL of the public disclosure.

13.1.3 Manufacturer Conformance with Occupational Health and Safety Performance
Conformance to ANSI Z10, Occupational Health and Safety Management Systems, or OHSAS 18001[11] shall be incorporated into the manufacturer's ISO 14001 management system.

13.2 Environmental Management System (Optional)

13.2.1 Environmental Management System (EMS) Certification (Corporate) *(JC Straw Balloted June 2014)*
EMS specified in 13.1.1 shall be certified to either ISO 14001 or EU EMAS by an accredited third party certification body.

13.2.2 Environmental and Social Responsibility Reporting on Supply Chain - Nine suppliers (Corporate)
Manufacturer shall publicly disclose corporate environmental and social responsibility performance using the key indicators of the Global Reporting Initiative (GRI) listed in Table 13.1 below.

The GRI "boundary" for this reporting shall be nine suppliers: the manufacturer's top three suppliers (by spend) of each of the following three types of components for the product category covered by this standard:

a. Principal storage device(s)
b. Principal semiconductor device(s)

[11] For OHSAS 180001, see http://www.ohsas-18001-occupational-health-and-safety.com/ohsas-18001-kit.htm

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c. Primary circuit board(s)

If there are less than three suppliers for a component type named above, every supplier for that component type shall be included in public disclosure.

GRI reporting format and frequency:

- Disclosures shall be accessible on the manufacturer's public website. The manufacturer shall declare the URL of the public disclosure. For supplier data it is acceptable to provide a link to supplier GRI reporting on supplier's website.
- Data shall be reported consistent with the Specific Standard Disclosures in the Global Reporting Initiative (GRI) Guidelines that are in effect at the time the disclosures are made as described in Table 13.1. (Note: GRI updated its guidelines in 2013, calling the new guidelines "G4." Companies making GRI disclosures after December 31, 2015 must use the G4 indicators.)
- Publication of a full report or reports 'in accordance' with the GRI Guidelines is not required, but would meet this criterion if the report(s) cover the indicators and boundaries specified in this criterion.
- Performance against these indicators shall be reported and publicly disclosed annually; data included in the report must be from within the last two years.

Manufacturer may claim up to 3 points for this criterion. To claim each point shown in Table 13.1, all the G4 indicators listed for the point shall be publicly disclosed for all 9 suppliers.

Table 13.1

#	GRI Code (G4)	GRI Indicators	Point Values
1	EN4	Energy consumption	1 point
2	EN5	Energy Intensity	
3	EN6	Reduction of energy consumption	
4	EN15	Direct GHG emissions (Scope 1)	
5	EN16	Energy indirect GHG emissions (Scope 2) Scope 2 = Purchased electricity.	
6	EN1	Materials Used by Weight or Volume	1 point
7	EN8	Total water withdrawal by source	
8	EN10	Percentage of water recycled and reused	
9	EN23	Total weight of waste by type and disposal method	
10	HR4	Freedom of Association and Collective Bargaining	1 point
11	HR6	Operations with risk for forced or compulsory labor	
12	HR5	Operations with risk for incidents of child labor	

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13.2.3 Environmental and Social Responsibility Reporting on Tier 1 Suppliers (Corporate)
Manufacturer shall publicly report on corporate environmental and social responsibility performance using the key indicators of the Global Reporting Initiative (GRI) listed in Table 13.2 below, and using the GRI reporting format and frequency specified in criterion 13.2.2.

The GRI "boundary" for this reporting shall be all Tier 1 suppliers who perform a manufacturing or assembly function for the manufacturer's server products.

The disclosure must include the detail outlined in Table 13.2.

Public disclosure shall be for all GRI aspects in Table 13.2. (x points)

#	GRI Code (G4)	GRI Indicators	Disclosure must include evaluation of supplier on these impacts:
12	LA14	Percentage of new suppliers screened with labor practice criteria	Labor practice criteria for screening and assessments must include compliance with laws on: - Minimum wages - Working hours - Compensation for overtime
13	LA15	Significant impacts for labor practices in supply chain and action	
14	SO9	Percentage of new suppliers screened using criteria for impacts on society	Disclosure must specify which societal impacts were used for screening and evaluation for these indicators.
15	SO10	Significant negative impacts on society in supply chain	
16	EN32	Percentage of new suppliers that were screened using environmental criteria	Disclosure must specify which environmental impacts were used for screening and evaluation for these indicators.
17	EN33	Significant actual and potential negative environmental impacts in the supply chain and actions taken	

13.3 Reporting Toxics Release Data (Optional)

13.3.1 Public Reporting of Toxics Release Data (Corporate) *(JC Straw Balloted June 2014)*
Manufacturer shall publicly report annually toxics release data for the following three types of components for servers (principal storage device(s)~~, i.e. hard drive~~; principal semiconductor device(s); and primary circuit board(s)) from each of the top three suppliers (by spend) for each component. ~~Reporting shall include at least the specific locations of the releases, and the identity and volume for each release.~~ The reported data shall be according to the reporting requirements and for chemicals listed on the:

- U.S. EPA Toxics Release Inventory, or
- United Nations, or the applicable country's or region's Protocol on Pollutant Release and Transfer Registry

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The data collected from the suppliers can be for their entire company or the specific part of the company that manufactures an identified component in a ~~registered~~ product declared to conform to this standard. If there are less than three suppliers for ~~each~~ a component type named above, every supplier for ~~the~~ component type needs to provide data.

Manufacturer's website shall either provide the annual disclosure or a link to a public repository containing the disclosure. The manufacturer shall declare the URL of the public disclosure.

Reporting shall include: • the specific locations of the releases, and • the identity and volume of each release.	1 point
Reporting shall also include: • the name of the company that is releasing the chemicals	1 point

Point value maximum: 2

13.4 Conflict Mineral Sourcing (Optional)

13.4.1 Conflict Minerals Sourced Only from Validated Conflict Free Smelters *(JC Straw Balloted June 2014)*
Manufacturers have determined the source of all conflict minerals used in all their products and determined that they are from either:

- Recycled or scrap sources; or
- Smelters and/or refiners which have been determined to be Conflict Free by the Conflict Free Sourcing Initiative, and appear on CFSI's list of validated smelters and refiners.

Informational Note: For CFSI list, see http://www.conflictfreesourcing.org/conflict-free-smelter-refiner-lists/.

13.4.2 Participation in In-Region Conflict-Free Sourcing Program (JC Straw Balloted June 2014)
Manufacturer supports and participates in one of the in-region conflict free controlled chain-of- custody sourcing programs such as Solutions for Hope, or Conflict Free Tin Initiative, which are committed to sourcing the minerals from conflict free sources in the region. (X points)

13.5 Compliance with Occupational Health and Safety and Social Responsibility Performance Standards (Optional)

13.5.1 Supply Chain Certification to Occupational Health and Safety Performance Standards
Manufacturer shall ensure that their 3 largest suppliers (based on total spend) for each of these three main components (principal storage device(s); principal semiconductor device(s); and primary circuit board(s)) produce these components in supplier facilities that are certified by accredited certification

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bodies to either ANSI Z10 or OHSAS 18001. Certification bodies shall be accredited by an International Accreditation Forum (IAF) member accreditation body (http://www.iaf.nu/) to certify to the specific standard identified.

If there are less than three suppliers for a component type named above, every supplier for that component type needs to provide data.

(X points)

~~14 Innovation in Environmental Performance~~

~~The purpose of this environmental category is to enable manufacturers to obtain additional points for a product which demonstrates innovation in environmental leadership above and beyond what is included in this standard. The maximum number of points that are available to be claimed in this category is XX.~~

~~Innovation points shall be based on environmental improvement of the product itself and not on product-related services or corporate initiatives. Point determinations will be made by the XX prior to product registration.~~

~~The manufacturer shall make publicly available a summary of the innovation, the environmental benefit(s) achieved, and the methodology used to evaluate and/or measure the benefit(s).~~

~~Details on evaluation of innovation claims and determination of points are provided in Annex G.~~

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Annex A –Table of Criteria and Optional Points

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Annex B – Conformity Assessment Guidance

This purpose of this Annex is to provide guidance on conformity assessment for selected criteria.

Note: Include explanation of the following general terms in criteria:

- Declaration/declare – information to be provided on the Product Registry by the manufacturer at the time of product registration
- Disclosure/disclose – information made available to the audience specified in criterion (e.g. purchasers, public, etc.)
- Documentation/document – information to be provided at time of verification

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Annex C- Criterion 5.3.4 Logged Server Activity Metrics: Data Acquisition and Format (*JC Straw Balloted June 2014)*

This Annex defines requirements for logging server activity in criterion 5.3.4. These requirements are intended to establish a lowest common denominator that could eventually become an industry standard, and hence expected of nearly all servers on the market.

- Each value listed shall be sampled at 2 Hz (i.e. twice per second)
- Each value listed shall be averaged over a one minute period and that average value shall be logged as one record per minute
- For each record, include date and time stamps as of the end of that one minute period in UTC format
- If product includes two CPUs, include percent utilization entries for each CPU
- If only one CPU, leave column for second CPU blank

Column Headers and Data Format shall be:

- Date
- Time
- Demand (watts)
- CPU-1 Util (%)
- CPU-2 Util (%)
- Physical memory utilization (%)
- Network throughput (%)
- Disk IO (%)
- Server Inlet Temperature (deg. C)

File Management shall be:

- Store data in CSV format
- Store 45 days-worth of data (~ 65,000 records)
- Age off oldest record as each new record is written, and rename file as necessary

File Name:

- File name shall be: "host-ID_activity_year_MO_DD.csv"
- Where the host-ID is the server host identifier, and most recent full day is included in the file name

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Annex D - Lists of Carcinogens, Reproductive Toxicants, and Persistent, Bioaccumulative, and Toxic (PBT) Substances

Carcinogens

Listed by the International Agency for Research on Cancer as:

- Group 1: carcinogenic to humans
- Group 2A: probably carcinogenic to humans

Listed by the National Toxicology Program as:

- Known human carcinogen
- Reasonably anticipated human carcinogen

Meet the criteria under the Globally Harmonized System of Classification and Labeling (GHS) for the Carcinogenicity hazard class (codes H350, H351)

Mutagens

European Union CMR List

- Category 1 – Substances known to be mutagenic to man
- Category 2 – Substances which should be regarded as if they are mutagenic to man

EU Risk Phrases

- R46: May cause heritable genetic damage
- R68: Possible risk of irreversible effects
- And all combination risk phrases containing R46 or R68

EU Classification, Labeling, and Packaging (CLP)

- H340: May cause genetic defects
- H341: Suspected of causing genetic defects

Globally Harmonized System of Classification and Labeling (GHS)

- Category 1A – Chemicals known to induce heritable mutations in germ cells of humans
- Category 1B – Chemicals which should be regarded as if they induce heritable mutations in the germ cells of humans
- Category 2 – Chemicals which cause concern for humans owing to the possibility that they may induce heritable mutations in the germ cells of humans

European Union. *Annex I - Classification and labelling requirements for hazardous substances and mixtures*. 2008 [cited 2011 September 13]; Available from: http://ec.europa.eu/enterprise/sectors/chemicals/documents/classification/index_en.htm

ECB, *Annex I of Directive 67-548-EEC*. 2007

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GHS, *Germ Cell Mutagenicity*. 2009, United Nations

Reproductive Toxicants

Listed under the State of California Safe Drinking Water and Toxic Enforcement Act (Prop 65) for reproductive or developmental toxicity

Meet the criteria under the Globally Harmonized System of Classification and Labeling (GHS) for the Reproductive Toxicity hazard class (codes H360, H361, H362)

PBT Substances

Stockholm Convention Persistent Organic Pollutants
U.S. – Canada Binational Toxics
Toxics Release Inventory (TRI) PBT chemicals
RCRA Waste Minimization Priority Chemicals

Endocrine Disruptors

The Endocrine Disruptor Exchange (TEDX) list (http://endocrinedisruption.org/endocrine-disruption/tedx-list-of-potential-endocrine-disruptors/overview)

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Annex ED – Example Template: Plastic Parts List and % Postconsumer Recycled Content

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Annex F~~E –~~ ~~Definition of Compostable and Recyclable Packaging Material (Normative)~~ QR Codes for Criterion 9.5.1 Information and Reporting on Disk Drive Magnet Type and Location

The QR code shall be printed in black on a white background if one or more of the magnets contain Neodymium. The magnet type shall be identified as Neodymium iron boron. The QR code shall include a non-machine readable chemical symbol (Nd):

In the case that neither magnet contains Neodymium, the QR code shall be printed in red on a white background:

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Annex GF – Criterion 11.2.1 System Boundaries, Example Flow *(JC Straw Balloted June 2014)*

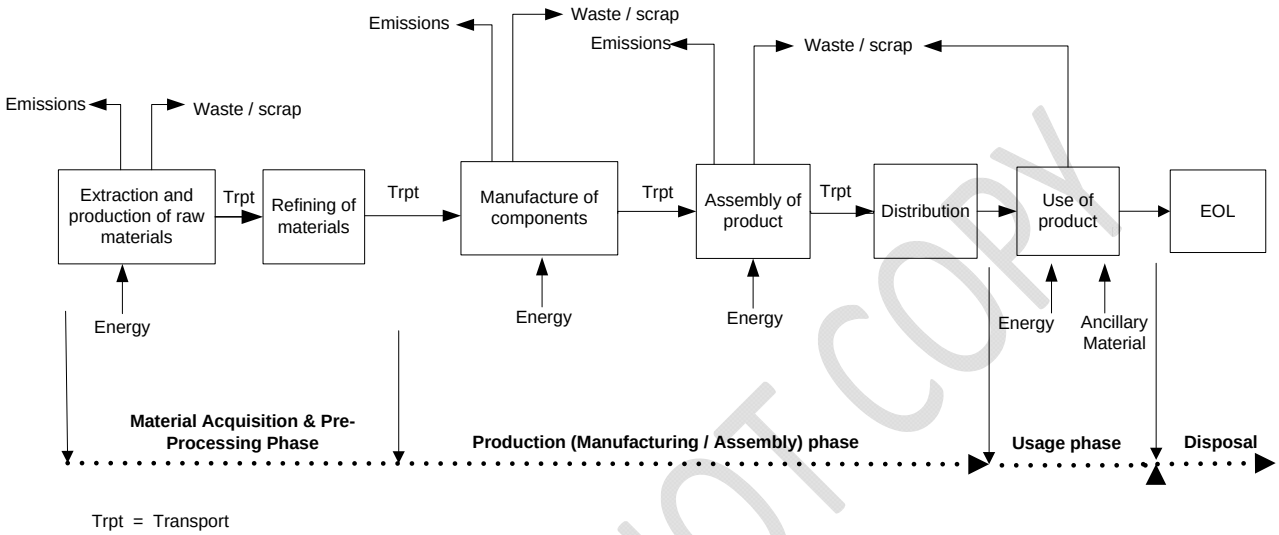

Figure 1: System Boundaries, example flow

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~~Annex G – Innovation Points Evaluation~~

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