Withdrawn Project

P1680.4/D2
Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Sponsor

<Committee Name>
of the
IEEE <Society Name>

Approved <Date Approved>

IEEE-SA Standards Board

Copyright © 2018 by The Institute of Electrical and Electronics Engineers, Inc.
Three Park Avenue
New York, New York 10016-5997, USA

All rights reserved.

This document is an unapproved draft of a proposed IEEE Standard. As such, this document is subject to change. USE AT YOUR OWN RISK! IEEE copyright statements SHALL NOT BE REMOVED from draft or approved IEEE standards, or modified in any way. Because this is an unapproved draft, this document must not be utilized for any conformance/compliance purposes. Permission is hereby granted for officers from each IEEE Standards Working Group or Committee to reproduce the draft document developed by that Working Group for purposes of international standardization consideration. IEEE Standards Department must be informed of the submission for consideration prior to any reproduction for international standardization consideration (stds.ipr@ieee.org). Prior to adoption of this document, in whole or in part, by another standards development organization, permission must first be obtained from the IEEE Standards Department (stds.ipr@ieee.org). When requesting permission, IEEE Standards Department will require a copy of the standard development organization's document highlighting the use of IEEE content. Other entities seeking permission to reproduce this document, in whole or in part, must also obtain permission from the IEEE Standards Department.

IEEE Standards Department
445 Hoes Lane
Piscataway, NJ 08854, USA

Deleted: 7

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.

Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Abstract:

Keywords:

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

Copyright © 2018 by The Institute of Electrical and Electronics Engineers, Inc.
All rights reserved. Published <Date Published>. Printed in the United States of America.

IEEE is a registered trademark in the U.S. Patent & Trademark Office, owned by The Institute of Electrical and Electronics Engineers, Incorporated.

PDF: ISBN 978-0-XXXX-XXXX-X STDXXXXX
Print: ISBN 978-0-XXXX-XXXX-X STDPDXXXXX

IEEE prohibits discrimination, harassment, and bullying.
For more information, visit http://www.ieee.org/web/aboutus/whatis/policies/p9-26.html.
No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

Deleted: 7

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.

Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Important Notices and Disclaimers Concerning IEEE Standards Documents

IEEE documents are made available for use subject to important notices and legal disclaimers. These notices and disclaimers, or a reference to this page, appear in all standards and may be found under the heading "Important Notices and Disclaimers Concerning IEEE Standards Documents." They can also be obtained on request from IEEE or viewed at http://standards.ieee.org/IPR/disclaimers.html.

Notice and Disclaimer of Liability Concerning the Use of IEEE Standards Documents

IEEE Standards documents (standards, recommended practices, and guides), both full-use and trial-use, are developed within IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association ("IEEE-SA") Standards Board. IEEE ("the Institute") develops its standards through a consensus development process, approved by the American National Standards Institute ("ANSI"), which brings together volunteers representing varied viewpoints and interests to achieve the final product. Volunteers are not necessarily members of the Institute and participate without compensation from IEEE. While IEEE administers the process and establishes rules to promote fairness in the consensus development process, IEEE does not independently evaluate, test, or verify the accuracy of any of the information or the soundness of any judgments contained in its standards.

IEEE does not warrant or represent the accuracy or content of the material contained in its standards, and expressly disclaims all warranties (express, implied and statutory) not included in this or any other document relating to the standard, including, but not limited to, the warranties of: merchantability; fitness for a particular purpose; non-infringement; and quality, accuracy, effectiveness, currency, or completeness of material. In addition, IEEE disclaims any and all conditions relating to: results; and workmanlike effort. IEEE standards documents are supplied "AS IS" and "WITH ALL FAULTS."

Use of an IEEE standard is wholly voluntary. The existence of an IEEE standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard.

In publishing and making its standards available, IEEE is not suggesting or rendering professional or other services for, or on behalf of, any person or entity nor is IEEE undertaking to perform any duty owed by any other person or entity to another. Any person utilizing any IEEE Standards document, should rely upon his or her own independent judgment in the exercise of reasonable care in any given circumstances or, as appropriate, seek the advice of a competent professional in determining the appropriateness of a given IEEE standard.

IN NO EVENT SHALL IEEE BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO: PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE PUBLICATION, USE OF, OR RELIANCE UPON ANY STANDARD, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE AND REGARDLESS OF WHETHER SUCH DAMAGE WAS FORESEEABLE.

Translations

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.

Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

The IEEE consensus development process involves the review of documents in English only. In the event that an IEEE standard is translated, only the English version published by IEEE should be considered the approved IEEE standard.

Official statements

A statement, written or oral, that is not processed in accordance with the IEEE-SA Standards Board Operations Manual shall not be considered or inferred to be the official position of IEEE or any of its committees and shall not be considered to be, or be relied upon as, a formal position of IEEE. At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that his or her views should be considered the personal views of that individual rather than the formal position of IEEE.

Comments on standards

Comments for revision of IEEE Standards documents are welcome from any interested party, regardless of membership affiliation with IEEE. However, IEEE does not provide consulting information or advice pertaining to IEEE Standards documents. Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments. Since IEEE standards represent a consensus of concerned interests, it is important that any responses to comments and questions also receive the concurrence of a balance of interests. For this reason, IEEE and the members of its societies and Standards Coordinating Committees are not able to provide an instant response to comments or questions except in those cases where the matter has previously been addressed. For the same reason, IEEE does not respond to interpretation requests. Any person who would like to participate in revisions to an IEEE standard is welcome to join the relevant IEEE working group.

Comments on standards should be submitted to the following address:

Secretary, IEEE-SA Standards Board
445 Hoes Lane
Piscataway, NJ 08854 USA

Laws and regulations

Users of IEEE Standards documents should consult all applicable laws and regulations. Compliance with the provisions of any IEEE Standards document does not imply compliance to any applicable regulatory requirements. Implementers of the standard are responsible for observing or referring to the applicable regulatory requirements. IEEE does not, by the publication of its standards, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Copyrights

IEEE draft and approved standards are copyrighted by IEEE under U.S. and international copyright laws. They are made available by IEEE and are adopted for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of engineering practices and methods. By making these documents available for use and adoption by public authorities and private users, IEEE does not waive any rights in copyright to the documents.

Photocopies

Subject to payment of the appropriate fee, IEEE will grant users a limited, non-exclusive license to photocopy portions of any individual standard for company or organizational internal use or

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.

Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

individual, non-commercial use only. To arrange for payment of licensing fees, please contact Copyright Clearance Center, Customer Service, 222 Rosewood Drive, Danvers, MA 01923 USA; +1 978 750 8400. Permission to photocopy portions of any individual standard for educational classroom use can also be obtained through the Copyright Clearance Center.

Updating of IEEE Standards documents

Users of IEEE Standards documents should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of amendments, corrigenda, or errata. An official IEEE document at any point in time consists of the current edition of the document together with any amendments, corrigenda, or errata then in effect.

Every IEEE standard is subjected to review at least every ten years. When a document is more than ten years old and has not undergone a revision process, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE standard.

In order to determine whether a given document is the current edition and whether it has been amended through the issuance of amendments, corrigenda, or errata, visit the IEEE-SA Website at http://ieeexplore.ieee.org/ or contact IEEE at the address listed previously. For more information about the IEEE–SA or IEEE's standards development process, visit the IEEE-SA Website at http://standards.ieee.org.

Errata

Errata, if any, for all IEEE standards can be accessed on the IEEE-SA Website at the following URL: http://standards.ieee.org/findstds/errata/index.html. Users are encouraged to check this URL for errata periodically.

Patents

Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken by the IEEE with respect to the existence or validity of any patent rights in connection therewith. If a patent holder or patent applicant has filed a statement of assurance via an Accepted Letter of Assurance, then the statement is listed on the IEEE-SA Website at http://standards.ieee.org/about/sasb/patcom/patents.html. Letters of Assurance may indicate whether the Submitter is willing or unwilling to grant licenses under patent rights without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination to applicants desiring to obtain such licenses.

Essential Patent Claims may exist for which a Letter of Assurance has not been received. The IEEE is not responsible for identifying Essential Patent Claims for which a license may be required, for conducting inquiries into the legal validity or scope of Patents Claims, or determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory. Users of this standard are expressly advised that determination of the validity of any patent rights, and the risk of infringement of such rights, is entirely their own responsibility. Further information may be obtained from the IEEE Standards Association.

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.

Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Participants

At the time this draft <gde./rec. prac./std.> was completed, the <Working Group Name> Working Group had the following membership:

<Chair Name>, *Chair*

The following members of the individual balloting committee voted on this <gde./rec. prac./std.>. Balloters may have voted for approval, disapproval, or abstention.

Balloter 1	Balloter 4	Balloter 7
Balloter 2	Balloter 5	Balloter 8
Balloter 3	Balloter 6	Balloter 9

When the IEEE-SA Standards Board approved this <gde./rec. prac./std.> on <Date Approved>, it had the following membership:

Jean-Philippe Faure, *Chair*
Gary Hoffman, *Vice Chair*
John Kulick, *Past Chair*
Konstantinos Karachalios, *Secretary*

Chuck Adams	Thomas Koshy	Robby Robson
Masayuki Ariyoshi	Joseph L. Koepfinger*	Dorothy Stanley
Ted Burse	Kevin Lu	Adrian Stephens
Stephen Dukes	Daleep Mohla	Mehmet Ulema
Doug Edwards	Damir Novosel	Phil Wennblom
J. Travis Griffith	Ronald C. Petersen	Howard Wolfman
Michael Janezic	Annette D. Reilly	Yu Yuan

*Member Emeritus

Copyright © 2018 IEEE. All rights reserved.
This is an unapproved IEEE Standards Draft, subject to change.

Deleted: 7

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.

Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Introduction

This introduction is not part of P<designation>/D<draft_number>, Draft <Gde./Rec. Prac./Std.> for <Complete Title Matching PAR>.

<Select this text and type or paste introduction text>

Deleted: 7

Copyright © 2018 IEEE. All rights reserved.
This is an unapproved IEEE Standards Draft, subject to change.

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.

Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Copyright © 2018, IEEE All rights reserved.

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

Contents

<After draft body is complete, select this text and click Insert Special->Add (Table of) Contents>

Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

1 Overview

1.1 Scope

This standard defines environmental and corporate social responsibility performance criteria for computer servers. For the purposes of this standard, the definition of computer server aligns with ENERGY STAR Program Requirements for Computer Servers 2.1[1].

Deleted: as defined in the ENERGY STAR Server specification

This standard establishes criteria for multiple levels of environmental leadership and corporate social responsibility performance throughout the product life cycle, relating to energy efficiency; management of substances; preferable materials use; product packaging; design for repair, reuse and recycling; product longevity; responsible end-of-life management; and corporate responsibility.

1.2 Purpose

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

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

This standard is an environmental leadership and corporate social responsibility standard, defined with the recognition that only leading products, i.e., approximately 25 – 35% of the products available in the marketplace, would be likely to qualify to the base or Bronze level, and even fewer at the Silver and Gold levels, at the date of publication of this standard, although this standard does not limit the number of products that can so qualify. As the environmental performance of products that are available in the marketplace and corporate social responsibility of server manufacturers improves, it is intended that the criteria will be updated and revised to set a higher performance standard for leadership products.

Deleted: ,
Deleted: ,

It is intended that this standard will be continually maintained and periodically reviewed to ensure that the definition of environmental leadership and corporate social responsibility, as reflected in the performance criteria, progresses with the evolution of technology and services and environmental and corporate social responsibility improvements in the product sector.

Deleted: T

[1] ENERGY STAR Program Requirements for Computer Server Version 2.1

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.

Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Copyright © 2018, IEEE All rights reserved.

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

2 Normative References

The following referenced documents are indispensable for the application of this document. Each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies. European Union Directives, which contain the adoption date in their title, shall not be treated as "dated standards or regulations" (as defined above). Unless explicitly indicated otherwise, when a European Union Directive is referenced in this standard, a new or updated European Union Directive shall apply as the referenced Directive upon its enforcement date.

80 Plus[2]

American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE) Thermal Guidelines for Data Processing Environments, 4th Edition[3]

ANSI/AIHA/ASSE Z10, Occupational Health and Safety Management System[4]

ASTM D256, Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics[5]

ASTM D7611/D7611M, Standard Practice for Coding Plastic Manufactured Articles for Resin Identification[6]

BizNGO Chemical Alternative Assessment Protocol[7]

EN 15343:2007, Plastics. Recycled plastics. Plastics recycling traceability and assessment of conformity and recycled content[8]

Deleted: BS

DIN 6120-1 - Marking of packaging and packaging materials for recycling purposes - Plastics packaging and packaging materials - Part 1: Graphical symbols[9]

EcoTransIT[10]

ECMA-341 Environmental Design Considerations for ICT & CE Products, 4th Edition / December 2010[11]
Electronic Industry Citizenship Coalition (EICC) Code of Conduct[12]

EN 16258 Methodology for calculation and declaration of energy consumption and GHG emissions of transport services (freight and passengers)[13]

[2] http://www.plugloadsolutions.com/80PlusPowerSupplies.aspx
[3] https://www.ashrae.org/resources--publications/bookstore/datacom-series#thermalguidelines
[4] http://www.asse.org/ansiaihaasse-z10-2012-occupational-health-safety-management-systems/ansi/aiha/asse-z10-2012-occupational-health-and-safety-management-systems/
[5] ASTM publications are available from the American Society for Testing and Materials http://www.astm.org/
[6] ASTM publications are available from the American Society for Testing and Materials http://www.astm.org/
[7] http://www.biznge.org/alternatives-assessment
[8] http://shop.bsigroup.com/ProductDetail/?pid=000000000030097507
[10] http://www.ecotransit.org/

Deleted: ¶

[10] http://www.ecotransit.org/
[11] ECMA-341 Environmental Design Considerations for ICT & CE Products, 4th Edition / December 2010
[12] http://www.eiccoalition.org/
[13] http://www.en-standard.eu/csn-en-16258-methodology-for-calculation-and-declaration-of-energy-consumption-and-ghg-emissions-of-transport-services-freight-and-passengers/

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

EN 50581, Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances[14]

EN 50625 Collection, logistics & treatment requirements for WEEE[15]

ENERGY STAR Program Requirements for Computer Server Version 2.1[16]

e-Stewards *Standard for Responsible Recycling and Reuse of Electronic Equipment*[17]

European Chemicals Agency, Guidance on requirements for substances in articles[18]

European Commission Joint Research Centre, International reference Life Cycle Data System (ILCD) Handbook[19]

European Union, Eco-Management and Audit Scheme (EMAS)[20]

European Union, European Commission Directive 94/62/EC of the European Parliament and of the Council on Packaging and Packaging Waste[21]

European Union, European Commission Directive 2012/19/EU of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE) [22]

European Union, European Commission Directive 2006/66/EC of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC

European Union, European Council former Directive 2002/95/EC as amended by 2005/618/EC and 2011/65/EU of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

European Union Regulation (EC) No. 1907/2006, Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)[23]

Global Logistics Emissions Council (GLEC) Framework[24]

Global Reporting Initiative Sustainability Reporting Standards[25]

GreenScreen® for Safer Chemicals methodology[26]

[14] https://www.en-standard.eu/csn-en-50581-technical-documentation-for-the-assessment-of-electrical-and-electronic-products-with-respect-to-the-restriction-of-hazardous-substances/
[15] http://www.cenelec.eu/
[16] ENERGY STAR publications are available from the ENERGY STAR Website at http://www.energystar.gov
[17] http://e-stewards.org
[18] http://echa.europa.eu/
[19] http://eplca.jrc.ec.europa.eu/?page_id=86. See Recommendations for Life Cycle Impact Assessment in the European context (EUR 24571 EN-2011) at: http://eplca.jrc.ec.europa.eu/uploads/ILCD-Recommendation-of-methods-for-LCIA-def.pdf
[20] http://ec.europa.eu/environment/emas/index_en.htm
[21] European Union Directives are available at http://europa.eu
[22] European Union Directives are available at http://europa.eu
[23] REACH regulations and information are available from the European Union at http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm
[24] http://www.smartfreightcentre.org/glec/what-is-glec
[25] https://www.globalreporting.org/
[26] www.greenscreenchemicals.org/method/method-documents

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

IEC 62321-3-1, Determination of certain substances in electrotechnical products - Part 3-1: Screening - Lead, mercury, cadmium, total chromium and total bromine using X-ray fluorescence spectrometry

IEC 62321-3-2, Determination of certain substances in electrotechnical products - 3-2: Screening - Total bromine in polymers and electronics by Combustion - Ion Chromatography

IEC 62474, Material declaration for products of and for the electrotechnical industry[27]

IEC TR 62635 Guidelines for end-of-life information provided by manufacturers and recyclers and for recyclability rate calculation of electrical and electronic equipment[28]

IEC 63000, Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

IEEE 1874 – IEEE Standard for Documentation Schema for Repair and Assembly of Electronic Devices/oManual[29]

International Accreditation Forum **(IAF), Multilateral Recognition Arrangement for the Scope of Accreditation**[30]

International Air Transportation Association (IATA) RP1678[31]

International Maritime Organization (IMO) Guidelines for voluntary use of the ship energy efficiency operational indicator (EEOI) (MEPC.1/Circ 684) (IMO)[32]

Interstate Chemicals Clearinghouse (IC2) Alternatives Assessment Guide, Hybrid or Sequential Frameworks[33]

IPCC Guidelines for National Greenhouse Gas Inventories, 2006[34]

ISO 179, Plastics—Determination of Charpy impact properties[35]

ISO 180, Plastics—Determination of Izod impact strength

ISO 1043, Plastics—Symbols and Abbreviated Terms

ISO 11469, Plastics—Generic identification and marking of plastics products

ISO 14001, Environmental management systems—Requirements with guidance for use

ISO 14021, Environmental Labels & Declarations—Self-declared environmental claims (Type II environmental labelling)

[27] IEC publications are available from the International Electrotechnical Commission http://www.iec.ch/
[28] Ibid
[29] IEEE publications are available from The Institute of Electrical and Electronics Engineers http://standards.ieee.org/
[30] http://www.iaf.nu/
[31] http://www.cofret-project.eu/downloads/pdf/rp-carbon-calculation.pdf
[32] http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Documents/Technical%20and%20Operational%20Measures/MEPC.1_Circ.684_Guidelines%20for%20Voluntary%20use%20of%20EEOI.pdf
[33] www.newmoa.org/prevention/ic2/IC2_AA_Guide-Version_1.pdf
[34] Available online at http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html
[35] ISO publications are available from the ISO Central Secretariat http://www.iso.org/

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

ISO 14025, Environmental labels and declarations—Type III environmental declarations—Principles and procedures

ISO 14040, Environmental management—Life cycle assessment—Principles and framework

ISO 14044, Environmental management—Life cycle assessment—Requirements and guidelines

ISO 17021-1, Conformity assessment—Requirements for bodies providing audit and certification of management systems

ISO/IEC 17065, Conformity assessment—Requirements for bodies certifying products, processes and services

ISO 50001 - Energy management systems—Requirements with guidance for use

LCA Society of Japan, Life-cycle Impact Assessment Method based on Endpoint modeling[36]

Model Toxics in Packaging Legislation [compilation was developed by CONEG and is administered by the Toxics in Packaging Clearinghouse (TPCH)][37]

Report of the National Academies of Science project "A Framework to Guide Selection of Chemical Alternatives"[38]

OECD, Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas[39]

OHSAS 18001, Occupational Health and Safety Management[40]

Responsible Recycling ("R2") Standard for Electronics Recyclers[41]

SmartWay[42]

Substitution Support Portal (SUBSPORT)[44]

UL ECVP 2809 (3rd edition), Environmental Claim Validation Procedure (ECVP) for Recycled Content[45]

United Nations Protocol on Pollutant Release and Transfer Registry[46]

University of Leiden Institute of Environmental Sciences (CML), Handbook on LCA[47]

U.S. Department of Energy Superior Energy Performance (SEP)[48]

[36] http://lca-forum.org/english/
[37] Available at http://www.toxicsinpackaging.org/
[38] http://www.nap.edu/catalog.php?record_id=18872
[39] Available at https://mneguidelines.oecd.org/mining.htm
[40] For OHSAS 18001, see http://www.ohsas-18001-occupational-health-and-safety.com/ohsas-18001-kit.htm and http://www.bsigroup.com/en-GB/ohsas-18001-occupational-health-and-safety/
[41] http://www.sustainableelectronics.org/r2-documents/
[42] https://www.epa.gov/smartway
[44] http://www.subsport.eu/about-the-portal
[45] http://ulstandards.ul.com/standard/?id=2809
[46] Available at http://www.unece.org/env/pp/prtr/Protocol%20texts/PRTR_Protocol_e.pdf
[47] http://cml.leiden.edu
[48] www.energy.gov/isosep

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7
Deleted: National Academies of Science, Design and Evaluation of Safer Chemical Substitutions – A Framework to Inform Government and Industry
Deleted: Decisions
Deleted: Social Accountability (SA) 8000[43]¶

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

U.S. Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, Section 1502[49]

U.S. EPA GHG Reporting Rule, Subpart I[50]

U.S. EPA, Life Cycle Assessment: Principles and Practice, Office of Research and Development. National Risk Management Research Laboratory, Editor 2006, U.S. EPA: Cincinnati, OH.[51]

U.S. EPA Protocol for Measuring Destruction or Removal Efficiency (DRE) of Fluorinated Greenhouse Gas Abatement Equipment in Electronics Manufacturing (U.S. EPA DRE Protocol)[52]

U.S. EPA Tool for the Reduction and Assessment of Chemical and other Environmental Impacts (TRACI) 2.1[53]

U.S. EPA Toxics Release Inventory[54]

U.S. Securities Exchange Act of 1934, Rule 13p-1[55]

WEEELABEX Treatment Standard[56]

3 Definitions, special terms, acronyms, and abbreviations

3.1 Definitions

Additives and fillers: Substances or compounds such as pigments and stabilizers added to polymers to improve processing, properties and end-use performance.

Bezel: Partial or full front facing cover of a product unit that may include openings for one or more drives or other replaceable devices.

NOTE – When extra drives or other replaceable devices are not installed, these bays are usually filled with blanks (see cosmetic blank/dummy) which are not technically part of the bezel.

Blade server[57]: A computer server that is designed for use in a blade chassis. A blade server is a high-density device that functions as an independent computer server and includes at least one processor and system memory, but is dependent upon shared blade chassis resources (e.g., power supplies, cooling) for operation. A processor or memory module that is intended to scale up a standalone server is not considered a blade server.

Bulk packaging: Single primary package used to ship more than one product.

[49] https://www.sec.gov/spotlight/dodd-frank/speccorpdisclosure.shtml
[50] http://www.epa.gov/ghgreporting/reporters/subpart/i.html
[52] http://www.epa.gov/semiconductor-pfc/documents/dre_protocol.pdf
Deleted: ¶
[52] http://www.epa.gov/semiconductor-pfc/documents/dre_protocol.pdf
[53] U.S. EPA, Tool for the Reduction and Assessment of Chemical and other Environmental Impacts, http://www.epa.gov/nrmrl/std/traci/traci.html
[54] Available at http://www.epa.gov/TRI/
[55] 17 CFR Parts 240 an 249b at https://www.sec.gov/rules/final/2012/34-67716.pdf
[56] http://media.wix.com/ugd/968606_0dbec6e7617cd83ae8307684f59d4244.pdf
[57] ENERGY STAR Program Requirements for Computer Server Version 2.1

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

Central processing unit (CPU): The logic circuitry that responds to and processes the basic instructions that drive a server. A typical CPU is a physical package to be installed on the server motherboard via a socket or direct solder attachment. The CPU package may include one or more processor cores.

Commonly available tools: A hand operated tool which is readily available for purchase by any individual or business without restrictions.

Competent authority: The governmental authority designated to be responsible, within such geographical areas as the Party may think fit, for receiving notifications of transboundary movements and any related information and for responding to such notifications.[58]

Computer server[59]: Hardware system providing services and manage 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).

NOTE 1 – For the purposes of this standard, the definition of computer server aligns with ENERGY STAR Program Requirements for Computer Servers 2.1. A computer server:

- is sold through enterprise channels for use in data centers and office/corporate environments;
- is primarily accessed via network connections, versus directly-connected user input devices such as a keyboard or mouse;
- 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.

Deleted: ,

Deleted: ,

NOTE 2 – also see *Product*.

Conflict free: A product that does not contain minerals that directly or indirectly finance or benefit armed groups in the Democratic Republic of the Congo (DRC) or an adjoining country.

NOTE 1—Conflict minerals that a manufacturer or its supplier(s) obtains from recycled or scrap sources, are considered conflict free.

NOTE 2 —The term "armed group" [60] means an armed group that is identified as perpetrators of serious human rights abuses in the annual Country Reports on Human Rights Practices under sections 116(d) and 502B(b) of the Foreign Assistance Act of 1961 (22 U.S.C. 2151n(d) and 2304(b)) relating to the Democratic Republic of the Congo or an adjoining country.

Conflict minerals[61]:

— Columbite-tantalite (coltan), cassiterite, gold, wolframite, or their derivatives, which are limited to tantalum, tin, and tungsten; and

— Any other mineral or its derivatives determined by the U.S. Secretary of State to be financing conflict in the Democratic Republic of the Congo or an adjoining country.

[58] United Nations Environment Program, Basel Convention.
[59] ENERGY STAR Program Requirements for Computer Server Version 2.1
[60] U.S. Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, Section 1502, and the U.S. Securities and Exchange Act of 1934, Rule 13p-1 (17 CFR Parts 240 and 249b)
[61] As defined in the U.S. Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, Section 1502, and the U.S. Securities and Exchange Act of 1934, Rule 13p-1 (17 CFR Parts 240 and 249b)

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Copyright © 2018, IEEE All rights reserved.

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

Conformity assessment body: An independent, third-party organization that conducts audits and determines conformance against the requirements of a specific standard.

Conformance assurance process: Process used by the manufacturer to manage compliance of the product to a restricted substance requirement. The process includes:

- A description of how supplier, materials, parts, and/or subassemblies risk factors are evaluated and allocated.
- The utilization of risk rating (or high risk status) to determine what evidence is required for suppliers, materials, parts, and/or subassemblies, as determined to be applicable by the manufacturer.
- The collection and evaluation of the evidence determined necessary for applicability, quality and accuracy, and associated action taken for a negative result. Note that analytical testing is an option, but is not required.
- A procedure to refresh the evidence as appropriate, based on the manufacturer's evaluation of risk.

Cosmetic blank/dummy: Cover or mockup provided as a placeholder for option(s).

De-installed: Unplugged equipment that is destined for, or intended to be destined for, removal from a customer site.

Disclosure: Information made available to the audience specified in criterion (e.g. purchasers, public, etc.).

Direct reuse: The using again, by a person other than its previous owner, of equipment and components that are not waste for the same purpose for which they were conceived without the necessity of repair, refurbishment or hardware upgrading.

Disposal: Any operation which does not lead to materials recovery, recycling, reclamation, or reuse of equipment or components, with or without energy reclamation. This includes operations which result in: the deposition of waste into, or on, land or water, or treatment via incineration.

Documentation: Information to be provided at time of verification or certification.

Electronic components: An individual part or combination of parts that, when together, perform a design function(s) and are typically directly attached to a printed circuit board.

NOTE—Examples include cables, connectors, sockets, discrete printed circuit board components and integrated circuits.

Elemental chlorine free (ECF): Packaging material produced with pulp from virgin content that has been bleached using a chlorine derivative such as chlorine dioxide (ClO_2), but without the use of elemental chlorine (Cl), or has not been bleached with chlorine compounds.

End-of-life: Life cycle stage of electronic equipment and components when they are no longer intended for use and are destined, or intended to be destined for, dismantling, material recovery, recycling or disposal.

Energy recovery: An operation where the material is used principally as a fuel or to generate energy.

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Copyright © 2018 IEEE All rights reserved.

ENERGY STAR certified: A product has been found to be in conformance with the ENERGY STAR Computer Servers eligibility criteria by an ENERGY STAR approved third-party certification body, and the product is listed on the ENERGY STAR Qualified Product List located at www.energystar.gov.

Environmental management system[62]**:** Part of an organization's management system used to develop and implement its environmental policy and manage its environmental aspects.

External enclosure: The outside casing of the product that houses its components.

Fan: An instrument for producing a current of air, comprised of 1) an impeller, or assembly of blades attached to an integral hub; and 2) an enclosure that surrounds the blades and hub and attaches to the hub.

Feedstock: Raw material used in a manufacturing process.

Fiber-based: Cellulose material derived from trees and other plants, including but not limited to wood, hemp, kenaf, palm, bamboo, straw and bagasse.

Final disposition: The last facility or operation managing equipment and or components and materials derived from them at which they either:

— Cease to be a waste by being processed into materials that will be used directly in manufacturing new products or processes;

— Have arrived for disposal and are finally disposed.

Firmware: Combination of a hardware device and computer instructions or computer data that reside as read-only software on the hardware device.

First customer: Organization or individual who first acquires (purchases, leases, receives by donation, etc.) and then uses the new product.

Idle state[64]**:** The operational state in which the OS and other software have completed loading, the computer server is capable of completing workload transactions, but no active workload transactions are requested or pending by the system (i.e., the computer server is operational, but not performing any useful work). For systems where ACPI Standards are applicable, idle state correlates only to ACPI System Level S0.

Impact assessment categories[65]**:** Classifications of human health and environmental effects caused by a product throughout its life cycle.

Initial service providers: Companies who contract directly with manufacturers or companies who contract with an agent acting on behalf of the manufacturer to provide one or more of the following take-back services: preparation for reuse or treatment of product/equipment/components.

Inventory data: The identification and quantification of energy, resource usage, and environmental emissions for a particular product, process, or activity.

[62] IEEE 1680.1-2018
[64] ENERGY STAR Program Requirements for Computer Server Version 2.1
[65] U.S. EPA, Life Cycle Assessment: Principles and Practice, Office of Research and Development. National Risk Management Research Laboratory, Editor 2006, U.S. EPA: Cincinnati, OH.

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7
Deleted: [63]
Deleted: the
Deleted: , fulfil compliance obligations, and address risks and opportunities
Deleted: NOTE 1 – Management system: set of interrelated or interacting elements of an organization to establish policies and objectives and processes to achieve those objectives. A management system can address a single discipline or several disciplines (e.g. quality, environment, occupational health and safety, energy, financial management). The system elements include the organization's structure, roles and responsibilities, planning and operation, performance evaluation and improvement. The scope of a management system can include the whole of the organization, specific and identified functions of the organization, specific and identified sections of the organization, or one or more functions across a group of organizations.¶
Deleted: NOTE 2 – Environmental aspects: element of an organization's activities or products or services that interacts or can interact with the environment.¶

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Copyright © 2018, IEEE All rights reserved.

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

Life cycle assessment (LCA)[66]: Compilation and evaluation of the inputs, outputs, and the potential environmental impacts of a product system throughout its life cycle.

Manufacturer: Any natural, legal person or entity who:

— Manufactures a product, or

— Has a product designed or manufactured, or

— Places a brand label on a ready-made product,

and places it on the market under their own name or trademark.

Multi-node server[67]: A computer server that is designed with two or more independent server nodes that share a single enclosure and one or more power supplies. In a multi-node server, power is distributed to all nodes through shared power supplies. Server nodes in a multi-node server are not designed to be hot-swappable.

Optical components: An individual part or combination of parts that are used in the creation, transmission, manipulation, or detection of light.

Packaging: All materials of any nature to be used for the containment, protection, handling, delivery and presentation of products from the manufacturer to the user or the customer.

NOTE - for the purposes of this standard, unless otherwise noted, the term "packaging" only applies to sales packaging or primary packaging, i.e. packaging that contains and protects and is designed to deliver a product unit to the final user or customer, and does not include pallets or the mechanism such as nails, screws and bolts that is used to temporarily attach primary packaging to pallets.

Packaging component[68]: Any individual assembled part of packaging such as, but not limited to, any interior or exterior blocking, bracing, cushioning, weatherproofing, exterior strapping, coatings, closures, inks, and labels.

Pedestal server[69]: A self-contained computer server that is designed with PSUs, cooling, I/O devices, and other resources necessary for stand-alone operation. The frame of a pedestal server is similar to that of a tower client computer.

Postconsumer recycled material[70]: Material generated by households or by commercial, industrial and institutional facilities, which can no longer be used for its intended purpose. This includes returns of material from the distribution chain.

NOTE—This definition applies to materials such as plastic, fiber, metal, etc.

Prepared for reuse: Equipment and components that have been checked, tested, cleaned, and/or repaired, and determined to be safe and fully functional with the intent to be placed back on the market in their original use or in their upgraded state, without further processing.

Principal storage device: Primary hardware in the product that stores the operating system, applications and data.

[66] ISO 14044: 2006
[67] ENERGY STAR Program Requirements for Computer Server Version 2.1
[68] Model Toxics in Packaging Legislation (www.toxicsinpackaging.org)
[69] ENERGY STAR Program Requirements for Computer Server Version 2.1
[70] ISO 14021, Environmental Labels & Declarations

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Printed circuit board: A thin board made of fiberglass, composite epoxy, or other laminate material with conductive pathways etched or "printed" onto the board, with the purpose of or to be used for the connection of different components on the board, such as transistors, resistors, and integrated circuits.

Processed chlorine free (PCF): Packaging material produced with pulp from virgin and/or recycled content that has been bleached without any type of chlorine, or that has not been bleached at all. Recycled content may have originally been bleached with chlorine or chlorine derivatives.

Processor (CPU): See *Central processing unit (CPU)*.

Product: A computer server:

— Within the scope of the ENERGY STAR Program Requirements for Computer Servers Version 2.1, including managed servers and blade servers, and

— 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.

NOTE 1—ENERGY STAR Program Requirements for Computer Servers Version 2.1 defines a computer server as all hardware and materials contained within the chassis, including the power supply unit.

NOTE 2—also see *Computer Server*.

NOTE 3—also see *Blade Server.* Only the blade server and not the blade chassis (i.e., shared blade chassis resources required for operation of the blade server) is within the scope of this standard.

Product specification: Product 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.

Publicly available: Obtainable to the public without restriction of access; for example, cannot require member only access. A requirement to provide a name and/or organization to obtain access is not considered a "restriction of access".

Rack-mounted server[71]**:** A computer server that is designed for deployment in a standard 19-inch data center rack. Specifications for data center racks can be found in EIA-310, IEC 60297, or DIN 41494. For the purposes of this standard, a blade server is considered under a separate category and excluded from the rack-mounted category.

Recovery: Operations that are part of a process to recapture elements, compounds, or materials and transform them into commodities.

Recyclable: Materials that can be removed or recovered from the whole product and put back into productive use as a material, not including energy recovery.

Recycled content[72]**:** Proportion, by weight, of recycled material in a product or packaging. Only preconsumer and postconsumer materials shall be considered as recycled content.

Recycling: Operations by which products, components, materials, or waste are processed and converted into raw materials for use in the production of new products or in processes, not including energy recovery or disposal.

Refurbishment: Functional or aesthetic maintenance or repair of a product to restore to original or upgraded functional state.

[71] ENERGY STAR Program Requirements for Computer Server Version 2.1
[72] ISO 14021, Environmental Labels & Declarations

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7
Deleted: ,
Deleted: as defined by EIA-310, IEC 60297, or DIN 41494

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Copyright © 2018, IEEE All rights reserved.

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

Reuse: Using again, equipment or components for the originally intended purpose, a similar purpose, or in an upgraded state, possibly after refurbishment, repair or hardware upgrading.

Reuse operator: The entity responsible for preparing equipment or components for reuse.

Sensitivity analysis[73]: A systematic evaluation process for describing the effect of variation of inputs to a system on the output.

Supplier: Entity that provides goods or services to the manufacturer.

Totally chlorine free (TCF): Packaging material produced with pulp from virgin content that has been bleached without any type of chlorine, or that has not been bleached at all.

Treatment: Material recovery or disposal operations, including preparation prior to recovery or disposal.

Treatment facility: Location where end-of-life equipment, components, or materials undergo treatment.

Treatment operator: The entity responsible for the treatment of equipment or components.

3.2 Special terms, acronyms and abbreviations

ACPI: Advanced Configuration and Power Interface

ADP: Abiotic depletion potential

ANAB: ANSI-ASQ National Accreditation Board

AP: Acidification Potential

BOB: Buffered on board

BIOS: Basic input/output system

CAS: Chemical abstract number

CCWG: Clean Cargo Working Group

CPU: Processor or central processing unit

CSR: Corporate sustainability report

DDR: Double data rate

DIMMs: Dual in-line memory modules

DRC: Democratic Republic of the Congo

EC: European community number

ECC: Error-correcting code

ECF: Elemental chlorine free

EICC: Electronic Industry Citizenship Coalition

[73] U.S. EPA, Life Cycle Assessment: Principles and Practice, Office of Research and Development. National Risk Management Research Laboratory, Editor 2006, U.S. EPA: Cincinnati, OH.

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Copyright © 2018, IEEE All rights reserved.

EMAS: European Union Eco-Management and Audit Scheme

EMI: Electromagnetic interference

EMS: Environmental management system

ESD: Electrostatic discharge

EP: Eutrophication potential

EPA: Environmental Protection Agency

EPC: Environmental product declaration

F-GHG: Fluorinated greenhouse gas

GHG: Greenhouse gas

GLEC: Global Logistics Emissions Council

GWP: Global Warming Potential

HTML: Hypertext markup language

IAF: International Accreditation Forum

IATA: International Air Transportation Association

ILCD: International Life Cycle Data

IMO: International Maritime Organization

I/O: Input/Output

IPCC: Intergovernmental Panel on climate change

IPSA: independent private sector audit

IS: International System of Units

LCA: Life cycle assessment

OECD: Organisation for Economic Co-operation and Development

ODP: Ozone depletion potential

OS: Operating system

PCR: Postconsumer recycled

PCF: Processed chlorine free

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7
Deleted: IATA: International Air Transportation Association
Deleted: IMO: International Maritime Organization

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Copyright © 2018, IEEE All rights reserved.

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

PDF: Portable document format

POCP: Photochemical ozone creation potential

PSU: Power supply unit

QR: Quick response

RIOS: Recycling Industry Operating Standard

RoHS: Restriction of Hazardous Substances

SASB: Sustainability Accounting Standards Board

SEC: Securities and Exchange Commission

SVHC: Substances of Very High Concern

TCF: Totally chlorine free

TRACI: Tool for the Reduction and Assessment of Chemical and other Environmental Impacts

URL: Uniform Resource Locator

WEEE: Waste electrical and electronic equipment

VAP: Validated Audit Process

XML: Extensible markup language

4 Conformance, evaluation and assessment

This standard is divided into eight performance categories consisting of required criteria and optional criteria:

- Energy efficiency
- Management of substances
- Preferable materials use
- Product packaging
- Design for repair, reuse and recycling
- Product longevity
- Responsible end-of-life management
- Corporate responsibility

4.1 Criteria

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

4.1.1 Required criteria

Each category has required criteria that shall be met in order to conform to this standard.

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Copyright © 2018, IEEE All rights reserved.

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

Table 4.1

Required Criteria	
5 Energy efficiency	
5.1.1	Required - ENERGY STAR
5.2.1	Required - Allowable temperature and humidity specifications
6 Management of substances	
6.1.1	Required - Conformance with provisions of European Union RoHS Directive
6.1.2	Required - Conformance with substance restriction requirements of the European Union Battery Directive
6.1.3	Required - Reduction of Bromine and Chlorine content of plastic parts > 25 grams
6.1.5	Required – Conformance with supply chain communication provisions of European Union REACH Regulation
7 Preferable materials use	
7.1.1	Required – Declaration of postconsumer recycled plastic content
7.1.2	Required - Minimum postconsumer recycled content in external enclosures
8 Product packaging	
8.1.1	Required—Elimination of added heavy metals in packaging
8.1.2	Required—Restriction on the use of elemental chlorine as a bleaching agent in paper-based packaging material
8.2.1	Required - Enhancing recyclability of packaging materials
8.3.1	Required - Recycled fiber content in corrugated packaging
9 Design for repair, reuse and recycling	
9.1.1	Required - Design for repair, reuse and recycling
9.1.2	Required - Design for plastics recycling
9.1.4	Required - Product recyclability calculation and minimum 90% recyclability rate
9.2.1	Required - Information and reporting in preparation for reuse and recycling
10 Product longevity	
10.1.1	Required - Replacement components availability
11 Responsible end-of-life management	
11.1.1	Required – Provision of product take-back service (corporate)
11.2.1	Required - End-of-life processing requirements (corporate)
11.2.2	Required - Trans-boundary movements (corporate)
12 Corporate responsibility	
12.1.1	Required - Environmental management system (EMS) (corporate)
12.3.1	Required - Public disclosure of use of conflict materials in products (corporate)
12.4.1	Required - Manufacturer conformance with occupational health and safety performance (corporate)

4.1.2 Optional points

Once the required criteria 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.

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Copyright © 2018, IEEE All rights reserved.

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

— Product criteria: Applies to the product declared to conform to the standard.

— Corporate criteria: Applies to the company that declares products to conform to this Standard.

4.1.4 Country or region specific criteria

All criteria in the standard are applicable only in countries or regions for which the product is declared to conform to this standard. Each criterion shall specify either of the following statements below on geographic applicability:

— "This criterion shall be declared the same in all countries or regions for which the product is declared to conform to this standard. The approach used to conform to this criterion may vary by country or region"; or

— "A manufacturer may declare this criterion differently in each country or region for which the product is declared to conform to this standard."

NOTE – Region means countries and territories whose independence may not be recognized by all countries (e.g., Taiwan).

4.1.5 Units of measure

Unless specified otherwise, units of measure within this standard shall be reported in the International System of Units (SI).

4.2 Levels of conformance

There are three levels of conformance:

— Bronze – meets all required criteria
— Silver – meets all required criteria plus at least 50% of the optional criteria points
— Gold – meets all required criteria plus at least 75% of the optional criteria points

The optional points can come from any of the performance categories. More than one point may be assigned to each optional criterion. If an optional criterion is not applicable (as noted in the criterion), those points are not included in the denominator of the calculation of percentage of optional criteria points.

5 Energy efficiency

5.1 ENERGY STAR

5.1.1 Required - ENERGY STAR

The product shall conform with the most current version of the ENERGY STAR Computer Servers program, as per the requirements in Table 5.1 below.

Table 5.1

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 country's or region's current ENERGY STAR Computer Servers Qualification Criteria Or

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

	• Product shall be on the country's or region'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

Geographic applicability: This criterion shall be met the in all countries or regions for which the product is declared to conform to this standard. The approach used to conform to this criterion may vary by country or region.

Verification requirements:

a) Identification of which of the above requirements in Table 5.1 to which the product conforms

b) Documentation demonstrating that product meets the relevant requirements in Table 5.1

c) For products that are not ENERGY STAR certified or listed on an international partner's ENERGY STAR qualified product listing, test results from an ENERGY STAR accredited lab[74] demonstrating that product conforms with the current version of the U.S. and Canada ENERGY STAR Computer Servers Eligibility Criteria

References and details: None

5.2 Allowable temperature and humidity specifications

5.2.1 Required - Allowable temperature and humidity specifications

Product shall support Class A2 allowable environmental operating range published in the *American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE) Thermal Guidelines for Data Processing Environments, 4th Edition*, in Table 2.1.

If the product is liquid cooled, "Not Applicable" may be declared.

Geographic applicability: This criterion shall be declared the same in all countries or regions for which the product is declared to conform to this standard. The approach used to conform to this criterion may vary by country or region.

Verification Requirements:

a) Documentation that the product can operate in ASHRAE Class A2 conditions, including the estimated number of hours per a specified time period that the server can operate in the allowable range without materially affecting the server

References and details: None

5.2.2 Optional – Liquid , liquefied-gas, or air-cooled servers operable at ASHRAE Class A3/A4 temperature ranges

The product shall be shipped with capability to liquid cool the processor and system memory (DIMMs and associated independent buffers) at a minimum. Liquid cooling involves the direct transfer of the heat from the processor and memory system to a liquid for removal of the heat from the information technology (IT) equipment;

Or

[74] https://www.energystar.gov/index.cfm?fuseaction=recognized_bodies_list.show_RCB_search_results

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Copyright © 2018, IEEE All rights reserved.

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

The air cooled server shall have allowable equipment environmental ranges as specified in *ASHRAE TC9.9 Thermal Guidelines for Data Processing Environments (4th edition, 2015)* of Class A3 or A4.

Optional points to be awarded as follows:

Table 5.2

Server Type	Criterion	Optional Points
Other (Non Resilient) Air Cooled Server	Server Operable in ASHRAE Class A3 Conditions	1
Resilient Air Cooled Server	Server Operable in ASHRAE Class A3 Conditions	2
Other (Non Resilient) Air Cooled Server	Server Operable in ASHRAE Class A4 Conditions	2
Resilient Air Cooled Server	Server Operable in ASHRAE Class A4 Conditions	3
Liquid Cooled Server	Server shipped with capability to liquid cool the processor and system memory (DIMMs and associated independent buffers) at a minimum	3

Point value: 3 maximum

Geographic applicability: This criterion shall be declared the same in all countries or regions for which the product is declared to conform to this standard. The approach used to conform to this criterion may vary by country or region.

Verification requirements:

a) Documentation indicating whether the product is classified as a Resilient or Non Resilient Server, and indicating to which ASHRAE classification that the equipment can operate (ASHRAE Class A3 or Class A4). The documentation shall specify the estimated number of hours per a specified time period that the server can operate in the allowable range without materially affecting the server reliability.

Or

b) Documentation indicating the capability to liquid cool the processor and system memory (DIMMs and associated independent buffers) at a minimum

References and details: ASHRAE TC9.9 Thermal Guidelines for Data Processing Environments (4th Edition, 2015) Criteria for determination of "Resilient" Server to be taken from latest ENERGY STAR Product Specification for Servers (http://www.energystar.gov/products/specs/).

5.3 Power supply efficiency

5.3.1 Optional - 80 plus program

Power supply/supplies shipped with the product shall have been tested as in conformance with the requirements of the 80 Plus© program Titanium level (http://www.plugloadsolutions.com/80PlusPowerSupplies.aspx).

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Copyright © 2018, IEEE All rights reserved.

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

Points shall be awarded as detailed in Table 5.3 below.

Table 5.3
80 Plus Titanium Level

Power Supply Unit	Total Points
Single Output	1
Multi Output	2

If the product does not ship with power supply/supplies, “Not Applicable” may be declared. For blade servers, manufacturer shall declare “Not Applicable” for this criterion.

Point value: 1 or 2

Geographic applicability: This criterion shall be declared the same in all countries or regions for which the product is declared to conform to this standard. The approach used to conform to this criterion may vary by country or region.

Verification requirements:

a) Statement from manufacturer indicating whether product contains single output or multi-output power supply

b) Test Report from independent, third-party laboratory demonstrating conformance with 80 Plus® Titanium level requirements

References and details: None

5.4 Active and Inactive Power States

5.4.1 Optional— Active State Power Management Enablement

Product shall be shipped with all of the following active state power management states enabled:

— Processor dynamic voltage and frequency scaling: Processors have the ability to dynamically change the voltage and frequency of the processor system based upon the load demand or activity level of the processor.

— Processor low power idle state: Idle processor cores are able to reduce applied voltage below minimum operating voltage during periods of inactivity.

— Dynamic Memory low power state: Memory devices are put into low power states during periods of inactivity such as the current self-refresh implementations in DDR memory.

Point value: 1

Geographic applicability: This criterion shall be declared the same in all countries or regions for which the product is declared to conform to this standard. The approach used to conform to this criterion may vary by country or region.

Verification requirements:

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.

Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Copyright © 2018, IEEE All rights reserved.

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

a) Product specification or screen snapshots of BIOS, firmware, or OS which show the power management states defined in above criterion are enabled on the product

5.4.2 Optional – Server Inactive Power State #1

The product is capable of achieving an inactive power state that seeks to reduce the energy use across the system to the extent practical while maintaining a rapid recovery time.

The Inactive Power State #1 will have a power level which is less than the idle power measurement reported for certification to ENERGY STAR, and recovery to a full active state (as specified in Verification Requirements) can be achieved in 10 seconds or less.

Manufacturer will provide information in product specification on Inactive Power State #1 power usage and the time required to achieve full active state when reactivated from Inactive Power State #1.

Point value: 1

Geographic applicability: This criterion shall be declared the same in all countries or regions for which the product is declared to conform to this standard. The approach used to conform to this criterion may vary by country or region.

Verification requirements:

a) Product specification from manufacturer indicating the Inactive Power State #1 power usage, the percentage of Inactive Power State #1 power usage when compared to the idle power measurement reported for certification to ENERGY STAR and the time required to achieve full active state when reactivated from Inactive Power State #1

b) Test Report showing power usage for Inactive Power State #1 as a percentage of idle power measurement reported for certification to ENERGY STAR

c) Test Report demonstrating the time required to return from the Inactive Power State #1 to active power state

References and details: Using the provided sleep and wake signals, data center control systems could passively manage power usage through scheduled low power states for certain percentages of available servers based upon anticipated loads, or dynamically manage power usage through hierarchical management of idle and deep sleep states for banks of servers based upon realized loads.

Statement with Inactive Power State #1 power usage and the time required to achieve full active state when reactivated from Inactive Power State #1 will enable the data center operator to determine how the power state can be integrated into the dynamic management of the data center.

5.4.3 Optional – Server Inactive Power State #2

The server is capable of achieving an inactive power state in which all components are unpowered with the exception of a subset of components, such as the power supply(ies), a service processor and/or other I/O electronics, necessary to allow for restart upon a call (signal) from the data center management software.

The Inactive Power State #2 will have a power level which is 30% or less of the idle power as measured for the product conformance with ENERGY STAR Computer Servers Eligibility Criteria, and recovery to a full active state (as specified in Verification Requirements) can be achieved in 20 minutes or less.

Manufacturer will provide information in product specifications on Inactive Power State #2 power usage and the time required to achieve full active state when reactivated from Inactive Power State #2.

Documents
Document Sharing Hub
Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.
Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers

Withdrawn Project

Copyright © 2018, IEEE All rights reserved.

Deleted: 1
Deleted: Nov
Deleted: 7
Deleted: 7

Point value: 1

Geographic applicability: This criterion shall be declared the same in all countries or regions for which the product is declared to conform to this standard. The approach used to conform to this criterion may vary by country or region.

Verification requirements:

a) Statement from manufacturer indicating the Inactive Power State #2 power usage, the percentage of Inactive Power State #2 power usage when compared to the idle power measurement reported for certification to ENERGY STAR and the time required to achieve full active state when reactivated from Inactive Power State #2

b) Test Report showing power usage for Inactive Power State #2 as a percentage of idle power measurement reported for certification to ENERGY STAR

c) Test Report demonstrating the time required to return from the Inactive Power State #2 to active power state

References and details: Using the provided sleep and wake signals, data center control systems could passively manage power usage through scheduled low power states for certain percentages of available servers based upon anticipated loads, or dynamically manage power usage through hierarchical management of idle and deep sleep states for banks of servers based upon realized loads.

Statement with Inactive Power State #2 power usage and the time required to achieve full active state when reactivated from Inactive Power State #2 will enable the data center operator to determine how the power state can be integrated into the dynamic management of the data center.

5.5 Systems energy efficiency

5.5.1 Optional - Energy efficient supply chains

Manufacturer shall demonstrate that supplier facilities manufacturing one or more listed components or services meet one of the following:

a) Third party certification to ISO 50001 or a nationally adopted version of ISO 50001. A supplier manufacturing facility will be considered ISO 50001 certified if it is certified individually or if it is within the scope of an enterprise ISO 50001 certification. Certification(s) shall have been obtained from a third party certification body accredited by an International Accreditation Forum (IAF) member accreditation body whose scope of accreditation includes the specified standard.

b) Third party certification to one of the following:

- The U.S. DOE Superior Energy Performance™ (SEP) program by an ANAB-accredited SEP verification body(ies)
- Korea Superior Energy Management System (Superior EnMS) Program[75], or
- A nationally equivalent program at the Silver level or higher. An equivalent program shall meet the requirements of the US DOE SEP program[76].

Deleted: Korea SEP (KSEP) program

Where a corporate certification is achieved by a supplier in accordance with a multisite certification, the certificate shall include all facilities claimed in the scope of facilities below.

[75] http://enms.energy.or.kr/

[76] Equivalency is defined by U.S. DOE at www.energy.gov/eere/amo/SEP-equivalency

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 27,2026 at 17:35:02 UTC from IEEE Xplore. Restrictions apply.

Full document details: P1680.4/D2, Mar 2018 - IEEE Draft Standard for Environmental Leadership and Corporate Social Responsibility Assessment of Servers