



Criteria for the Sustainability Assessment of Network  
Equipment for the Green Electronics Council EPEAT®  
Ecolabel and the TÜV Rheinland Green Product Mark

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115 Criteria for the Sustainability Assessment of Network Equipment for  
116 the Green Electronics Council EPEAT® Ecolabel and the TÜV  
117 Rheinland Green Product Mark

118  
119 **Foreword**

120 The principles and procedures applied to develop this document are based on the following  
121 normative documents:

122

- 123 • ISO/IEC Directives, Part 1 and Part 2
- 124 • ISO/IEC Guide 21, Part 1 and Part 2
- 125 • ISO Guide 64
- 126 • ISO Guide 82
- 127 • ISO 14024
- 128 • US OMB Circular A-119
- 129 • US EPA Guidelines for Environmental Performance Standards and Ecolabels for  
130 Use in Federal Procurement
- 131 • ISEAL Code of Good Practice for Setting Social and Environmental Standards

132

133 A prior study was conducted to determine the feasibility of criteria development for  
134 network equipment, and to identify primary environmental and social impacts of network  
135 equipment. The findings and considerations arising from this study guided the criteria  
136 development work.

137

138 This document was developed using a multi-stakeholder approach involving experts from  
139 multiple stakeholder groups including but not limited to manufacturers; other industry,  
140 such as suppliers and their trade associations, recyclers and their trade associations,  
141 telecom and data center operators and their trade associations, and other types of  
142 businesses commercially engaged with the product; sustainability advocates and  
143 regulators; and purchasers and ecolabeling criteria users. Reasonable efforts were made  
144 to achieve balanced representation of the above interest categories with no one interest  
145 category representing more than 1/3 of voting members, and to achieve consensus  
146 throughout the process.

147

148 Public consultation was implemented to allow additional stakeholders the opportunity to  
149 provide comments on the criteria, and modification of criteria, as appropriate.

150

151 The criteria development work is carried out through the technical governance bodies  
152 jointly established by TÜV Rheinland and the Green Electronics Council (GEC).

153

154 Attention is drawn to the possibility that some of the elements of this document may be  
155 the subject of patent rights. TÜV Rheinland and GEC shall not be held responsible for  
156 identifying any or all such patent rights.

157

158

## 159 Introduction

160 Product sustainability labeling programs award their sustainability labels to products that  
161 meet a set of social and environmental requirements predetermined for a product and  
162 associated manufacturers. EPEAT® and the Green Product Mark are voluntary  
163 sustainability labelling schemes operating in accordance with ISO 14020 *Environmental*  
164 *labels and declarations – General principles* and ISO 14024 *Environmental labels and*  
165 *declarations – Type I environmental labelling – Principles and procedures*. Through the  
166 communication of verifiable and accurate information on sustainability aspects of  
167 products, EPEAT and Green Product Mark aim to stimulate the potential for market-driven  
168 continuous improvement.

169  
170 EPEAT, managed by the Green Electronics Council (GEC), is the leading global ecolabel for  
171 IT products. GEC is a mission driven non-profit that collaborates to achieve a world in  
172 which only sustainable IT products are designed, manufactured, and purchased. The  
173 Green Product Mark certification scheme is owned by TÜV Rheinland, a leading  
174 international technical service provider who have been developing solutions to ensure  
175 the safety, quality and economic efficiency of the interaction between man, technology  
176 and the environment.

177  
178 This document is intended to convey clear and unambiguous requirements to be fulfilled  
179 for network equipment products to be awarded the EPEAT Ecolabel and, or the Green  
180 Product Mark. Please refer to EPEAT<sup>1</sup> and the Green Product Mark<sup>2</sup> scheme requirements  
181 for further information on conformance, certification and authorized use of these criteria.  
182

## 183 1 Scope

184 Products within the scope of these criteria include large and small network equipment.  
185 Network equipment are devices whose primary function is to pass Internet Protocol  
186 traffic among various network interfaces/ports. Large network equipment is mountable  
187 in a standard equipment rack, supports network management protocols (e.g. SNMP) and  
188 contain more than eleven (11) physical network ports and, or total aggregate port  
189 throughput greater than 12 Gb/s. Small network equipment is designed for stationary  
190 operation, contain no more than eleven (11) wired physical network ports and is primarily  
191 configured for operation outside standard equipment racks.<sup>3</sup>

192 This document provides lifecycle-based criteria, from raw material extraction to  
193 component and product manufacturing and end-of-life, organized by the following four  
194 sustainability impact areas:

- 195 • Reduction of chemicals of concern;
- 196 • Sustainable use of resources;

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<sup>1</sup> About the EPEAT scheme - <https://greenelectronicscouncil.org/epeat/epeat-overview/>

<sup>2</sup> About the Green Product Mark - <https://www.tuv.com/content-media-files/master-content/services/products/1293-tuv-rheinland-green-product-mark/tuv-rheinland-green-product-mark-scheme-summary-en.pdf>

<sup>3</sup> ENERGY STAR® [Large Network Equipment](#) and [Small Network Equipment](#) specifications

- 197       • Climate change mitigation; and  
198       • Corporate environment, social and governance performance.  
199

200 Criteria address the product and product packaging.

201

## 202 2 Normative references

203 The following documents, in whole or in part, are normatively referenced in this  
204 document and are indispensable for its application. For dated references, only the edition  
205 cited applies. For undated references, the latest edition of the referenced document  
206 (including any amendments) applies. European Union Directives, which contain the  
207 adoption date in their title, are not be treated as “dated references” (as described above).  
208 Unless explicitly indicated otherwise, when a European Union Directive is referenced in  
209 this document, a new or updated European Union Directive shall apply upon its  
210 enforcement date unless otherwise noted in the criteria.

211

212 80 Plus<sup>4</sup>

213

214 ANSI/AIHA/ASSE Z10, *Occupational Health and Safety Management System*<sup>5,6</sup>

215

216 ASTM D256, *Standard Test Methods for Determining the Izod Pendulum Impact Resistance of*  
217 *Plastics*<sup>7</sup>

218

219 ASTM D7611/D7611M, *Standard Practice for Coding Plastic Manufactured Articles for Resin*  
220 *Identification*<sup>7</sup>

221

222 California Health and Safety Code Section 25214.11-25214.26<sup>8</sup>

223

224 Code of Conduct on Energy Consumption of Broadband Equipment Version 7.1 and Reporting  
225 sheet CoC BB equipment<sup>9</sup>

226

227 Conflict Free Tin Initiative<sup>10</sup>

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<sup>4</sup> Ecova Plug Load Solutions. 5000 North Atlantic Street, Suite 1313, Spokane, Washington USA 99201.  
<[www.plugloadsolutions.com](http://www.plugloadsolutions.com)>

<sup>5</sup> American Industrial Hygiene Association. 3141 Fairview Park Drive, Suite 777, Falls Church, VA 22042. <[www.aiha.org](http://www.aiha.org)>

<sup>6</sup> ASSE International. 18927 Hickory Creek Drive, Suite 220, Mokena, IL 60448. <[www.asse-plumbing.org](http://www.asse-plumbing.org)>

<sup>7</sup> ASTM International. 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. <[www.astm.org](http://www.astm.org)>

<sup>8</sup> California Health and Safety Code, Article 10.4. Toxics in Packaging Prevention Act,  
[https://leginfo.ca.gov/faces/codes\\_displayText.xhtml?lawCode=HSC&division=20.&title=&part=&chapter=6.5.&article=10.4](https://leginfo.ca.gov/faces/codes_displayText.xhtml?lawCode=HSC&division=20.&title=&part=&chapter=6.5.&article=10.4).

<sup>9</sup> EU Code of Conduct for Energy Consumption of Broadband Equipment Version 7.1,  
<https://e3p.jrc.ec.europa.eu/publications/eu-code-conduct-energy-consumption-broadband-equipment-version-7-0>

<sup>10</sup> Resolve. 1255 23<sup>rd</sup> Street NW, Suite 275, Washington, DC 20037. [www.resolve.ngo/site-cfti](http://www.resolve.ngo/site-cfti)

228	
229	ChemForward <sup>11</sup>
230	
231	Cradle to Cradle Certified™ <sup>12</sup>
232	
233	DIN 6120-1, <i>Marking of packaging and packaging materials for recycling purposes – Plastics</i>
234	<i>packaging and packaging materials – Part 1: Graphical symbols</i> <sup>13</sup>
235	
236	EcoTransIT <sup>14</sup>
237	
238	ECMA-341, <i>Environmental Design Considerations for ICT &amp; CE Products</i> , 4th Edition / December
239	2010 <sup>15</sup>
240	
241	EN 16258, <i>Methodology for calculation and declaration of energy consumption and GHG</i>
242	<i>emissions of transport services (freight and passengers)</i> <sup>16</sup>
243	
244	EN 50581, <i>Technical documentation for the assessment of electrical and electronic products with</i>
245	<i>respect to the restriction of hazardous substances</i> <sup>16</sup>
246	
247	EN 50625, <i>Collection, logistics &amp; treatment requirements for WEEE</i> <sup>16</sup>
248	
249	ENERGY STAR®, <i>Program Requirements for Large Network Equipment</i> <sup>17</sup>
250	
251	ENERGY STAR®, <i>Program Requirements for Small Network Equipment</i> <sup>18</sup>
252	
253	e-Stewards, <i>Standard for Responsible Recycling and Reuse of Electronic Equipment</i> <sup>19</sup>
254	
255	European Commission Joint Research Centre, <i>International reference Life Cycle Data System</i>
256	<i>(ILCD) Handbook</i> <sup>20</sup>

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<sup>11</sup> ChemForward - <https://www.chemforward.org/>

<sup>12</sup> Cradle to Cradle Certified - <https://www.c2ccertified.org/get-certified/product-certification>

<sup>13</sup> German Institute for Standardisation (Deutsches Institut für Normung)

<sup>14</sup> EcoTransIT World. IVE mbH Lützerodestraße 10, 30161 Hanover, Germany. <[www.ecotransit.org](http://www.ecotransit.org)>

<sup>15</sup> ECMA International. Rue du Rhône 114, 1204 Geneva, Switzerland. [www.ecma-international.org](http://www.ecma-international.org)

<sup>16</sup> European Normative Standard, [https://europa.eu/youreurope/business/product-requirements/standards/standards-in-europe/index\\_en.htm#shortcut-2](https://europa.eu/youreurope/business/product-requirements/standards/standards-in-europe/index_en.htm#shortcut-2)

<sup>17</sup> ENERGY STAR® Large Network Equipment Specification, [https://www.energystar.gov/products/spec/large\\_network\\_equipment\\_specification\\_version\\_1\\_0\\_pd](https://www.energystar.gov/products/spec/large_network_equipment_specification_version_1_0_pd)

<sup>18</sup> ENERGY STAR® Small Network Equipment Specification, [https://www.energystar.gov/products/spec/small\\_network\\_equipment\\_specification\\_version\\_1\\_0\\_pd](https://www.energystar.gov/products/spec/small_network_equipment_specification_version_1_0_pd)

<sup>19</sup> e-Stewards. 80 Yesler Way, Suite 300, Seattle, WA 98104. <[www.e-stewards.org](http://www.e-stewards.org)>

<sup>20</sup> European Commission Joint Research Centre. Rue du Champ de Mars 21, 1050 Brussels, Belgium. <[eplca.jrc.ec.europa.eu](http://eplca.jrc.ec.europa.eu)>



257	
258	European LCA Platform Database <sup>21</sup>
259	
260	European Union, Eco-Management and Audit Scheme (EMAS) <sup>22</sup>
261	
262	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 <sup>23</sup>
263	
264	
265	European Union, European Commission Directive 2012/19/EU of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE) <sup>23</sup>
266	
267	
268	European Union, European Commission Directive 94/62/EC of the European Parliament and of the Council on Packaging and Packaging Waste <sup>23</sup>
269	
270	
271	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) <sup>23</sup>
272	
273	
274	
275	European Union Product Environmental Footprint Guide <sup>24</sup>
276	
277	European Union Regulation (EC) No. 1907/2006, <i>Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)</i> <sup>23</sup>
278	
279	
280	Global Logistics Emissions Council (GLEC) Framework <sup>25</sup>
281	
282	Global Reporting Initiative <sup>26</sup>
283	
284	GreenScreen® for Safer Chemicals methodology <sup>27</sup>
285	
286	IEC 62321-3-1, <i>Determination of certain substances in electrotechnical products - Part 3-1: Screening - Lead, mercury, cadmium, total chromium and total bromine using X-ray fluorescence spectrometry</i> <sup>28</sup>
287	
288	
289	

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<sup>21</sup> European Commission Platform on Life Cycle Assessment, <https://eplca.jrc.ec.europa.eu/>

<sup>22</sup> European Commission Environment. B-1049 Brussels, Belgium. <[www.ec.europa.eu/environment/emas](http://www.ec.europa.eu/environment/emas)>

<sup>23</sup> European Union legislation is available at [www.europa.eu](http://www.europa.eu); <https://eur-lex.europa.eu/homepage.html>

<sup>24</sup> European Union Product Environmental Footprint Guide.  
[https://ec.europa.eu/environment/eusd/smgp/dev\\_methods.htm](https://ec.europa.eu/environment/eusd/smgp/dev_methods.htm)

<sup>25</sup> Global Logistics Emissions Council. Keizersgracht 560, Amsterdam, Netherlands. <[www.smartfreightcentre.org](http://www.smartfreightcentre.org)>

<sup>26</sup> Global Reporting Initiative. PO Box 10039, 1001 EA, Amsterdam, The Netherlands. <[www.globalreporting.org](http://www.globalreporting.org)>

<sup>27</sup> Clean Production Action. 1310 Broadway, Suite 101, Somerville, MA 02144. [www.greenscreenchemicals.org](http://www.greenscreenchemicals.org)

<sup>28</sup> International Electrotechnical Commission. 3, rue de Varembé, 1st floor, PO Box 131, CH – 1211, Geneva 20, Switzerland.  
<[www.iec.ch](http://www.iec.ch)>

290	IEC 62321-3-2, <i>Determination of certain substances in electrotechnical products - 3-2: Screening -</i>
291	<i>Total bromine in polymers and electronics by Combustion - Ion Chromatography</i> <sup>28</sup>
292	
293	IEC 62474, <i>Material declaration for products of and for the electrotechnical industry</i> <sup>28</sup>
294	
295	IEC 63000, <i>Technical documentation for the assessment of electrical and electronic products with</i>
296	<i>respect to the restriction of hazardous substances</i> <sup>28</sup>
297	
298	IEEE 802.3az Energy Efficiency of Small Network Equipment <sup>29</sup>
299	
300	IEEE 1874 – IEEE Standard for Documentation Schema for Repair and Assembly of Electronic
301	Devices / Manual <sup>30</sup>
302	
303	International Accreditation Forum (IAF) <sup>31</sup>
304	
305	International Air Transportation Association (IATA), RP 1678 <sup>32</sup>
306	
307	International Maritime Organization (IMO) <sup>33</sup>
308	
309	Interstate Chemicals Clearinghouse (IC2), <i>Alternatives Assessment Guide, Hybrid or Sequential</i>
310	<i>Frameworks</i> <sup>34</sup>
311	
312	IPCC, <i>Guidelines for National Greenhouse Gas Inventories, 2006</i> <sup>35</sup>
313	
314	ISO 179, <i>Plastics – Determination of Charpy impact properties</i> <sup>36</sup>
315	
316	ISO 180, <i>Plastics – Determination of Izod impact strength</i> <sup>36</sup>
317	
318	ISO 1043, <i>Plastics – Symbols and Abbreviated Terms</i> <sup>36</sup>
319	
320	ISO 11469, <i>Plastics – Generic identification and marking of plastics products</i> <sup>36</sup>
321	
322	ISO 14001, <i>Environmental management systems – Requirements with guidance for use</i> <sup>36</sup>

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<sup>29</sup> IEEE 802.3az Energy Efficiency of Small Network Equipment, [https://standards.ieee.org/standard/802\\_3az-2010.html](https://standards.ieee.org/standard/802_3az-2010.html)

<sup>30</sup> Institute for Electrical and Electronics Engineers (IEEE), Piscataway, NJ, <https://standards.ieee.org/https://standards.ieee.org/standard/1874-2013.html>;

<sup>31</sup> International Accreditation Forum. PO Box 819, Cherrybrook 2126 NSW, Australia. <[www.iaf.nu](http://www.iaf.nu)>

<sup>32</sup> International Air Transportation Association. IATA USA, 703 Waterford Way, Suite 600, Miami, FL 33126. <[www.iata.org](http://www.iata.org)>.

<sup>33</sup> International Maritime Organization. 4, Albert Embankment, London SE1 7SR, United Kingdom. <[www.imo.org](http://www.imo.org)>

<sup>34</sup> Interstate Chemicals Clearinghouse. 89 South Street, Suite 600, Boston, MA 02111-2651. <[www.theic2.org](http://www.theic2.org)>

<sup>35</sup> Intergovernmental Panel on Climate Change. 7 bis Avenue de la Paix, C.P. 2300, CH-1211, Geneva 2, Switzerland. <[www.ipcc.ch](http://www.ipcc.ch)>

<sup>36</sup> International Organization for Standardization. Chemin de Blandonnet 8, Case Postale 401, 1214 Vernier, Geneva, Switzerland. <[www.iso.org](http://www.iso.org)>

323	
324	ISO 14025, <i>Environmental labels and declarations – Type III environmental declarations – Principles and procedures</i> <sup>36</sup>
325	
326	
327	ISO 14040, <i>Environmental management – Life cycle assessment – Principles and framework</i> <sup>36</sup>
328	
329	ISO 14044, <i>Environmental management – Life cycle assessment – Requirements and guidelines</i> <sup>36</sup>
330	
331	ISO/IEC 17065, <i>Conformity assessment – Requirements for bodies certifying products, processes and services</i> <sup>36,28</sup>
332	
333	
334	ISO 45001, <i>Occupational Health and Safety Management Systems</i> <sup>36</sup>
335	
336	ISO 50001, <i>Energy management systems – Requirements with guidance for use</i> <sup>36</sup>
337	
338	Korea Energy Management System (EnMS) Program <sup>37</sup>
339	
340	LCA Society of Japan, <i>Life-cycle Impact Assessment Method based on Endpoint modeling</i> <sup>38</sup>
341	
342	Model Toxics in Packaging Legislation [compilation was developed by CONEG and is administered by the Toxics in Packaging Clearinghouse (TPCH)] <sup>39</sup>
343	
344	
345	OECD, <i>Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas</i> <sup>40</sup>
346	
347	
348	OHSAS 18001, <i>Occupational Health and Safety Management</i> <sup>41</sup>
349	
350	Pharos <sup>42</sup>
351	
352	Public Private Alliance for Responsible Mineral Trade <sup>43</sup>
353	
354	Responsible Business Association (RBA) Code of Conduct <sup>44</sup>
355	

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<sup>37</sup> Korea Energy Agency, Energy Management System. 323 Jongga-ro, Jung-gu, Ulsan (#528-1 Ujeong-dong), Republic of Korea 44538. [www.energy.or.kr/renew\\_eng/energy/industry/enms.aspx](http://www.energy.or.kr/renew_eng/energy/industry/enms.aspx)

<sup>38</sup> LCA Society of Japan. LCA Development Office, 2-1, Kajicho 2-chome, Chiyoda-ku, Tokyo, 101-0044. <lca-forum.org/english>

<sup>39</sup> Model Toxics in Packaging Legislation. c/o NERC. 139 Main Street, Suite 401, Brattleboro, VT 05301. <[www.toxicsinpackaging.org](http://www.toxicsinpackaging.org)>

<sup>40</sup> Organisation for Economic Cooperation and Development. 2, rue André Pascal, 75775 Paris Cedex 16, France. <[mneguidelines.oecd.org](http://mneguidelines.oecd.org)>; <https://www.oecd.org/daf/inv/mne/OECD-Due-Diligence-Guidance-Minerals-Edition3.pdf>

<sup>41</sup> OHSAS 18001, BSI Group. 389 Chiswick High Road, London W4 4AL, United Kingdom. <[www.bsigroup.com](http://www.bsigroup.com)>

<sup>42</sup> Pharos. 1710 Connecticut Ave NW, 4th Floor Washington DC 20009 <[pharosproject.net](http://pharosproject.net)>

<sup>43</sup> Public-Private Alliance for Responsible Minerals Trade. [www.resolv.org/site-ppa](http://www.resolv.org/site-ppa)

<sup>44</sup> Responsible Business Alliance. 1737 King Street, Suite 330, Alexandria, VA 22314. <[www.responsiblebusiness.org](http://www.responsiblebusiness.org)>

356	Scivera Chemical Hazard Assessment <sup>45</sup>
357	
358	SmartWay Program <sup>46</sup>
359	
360	Social Accountability International (SA) 8000 <sup>47</sup>
361	
362	Sustainable Electronics Recycling International, <i>Responsible Recycling (R2) Standard for Electronics Recyclers</i> <sup>48</sup>
363	
364	
365	UL ECVP 2809, <i>Environmental Claim Validation Procedure (ECVP) for Recycled Content</i> , 2 <sup>nd</sup> edition <sup>49</sup>
366	
367	
368	University of Leiden Institute of Environmental Sciences (CML), <i>Handbook on LCA</i> <sup>50</sup>
369	
370	US DOE 50001, <i>Superior Energy Performance (50001 SEP)</i> <sup>51</sup>
371	
372	US EPA, GHG Reporting Rule, Subpart I <sup>52</sup>
373	
374	US EPA, <i>Life Cycle Assessment: Principles and Practice</i> , Office of Research and Development.
375	<i>National Risk Management Research Laboratory, Editor 2006</i> , US EPA: Cincinnati, OH <sup>52</sup>
376	
377	US EPA <i>Tool for the Reduction and Assessment of Chemical and other Environmental Impacts (TRACI) 2.1</i> <sup>52</sup>
378	
379	
380	US Life Cycle Inventory (LCI) Database <sup>53</sup>
381	

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<sup>45</sup> Scivera, <https://www.scivera.com/>

<sup>46</sup> US EPA, SmartWay Program. SmartWay Transport Partnership, 2000 Traverwood Drive, Ann Arbor, MI 48105. <[www.epa.gov/smartway](http://www.epa.gov/smartway)>

<sup>47</sup> Social Accountability International. 9 East 37<sup>th</sup> Street, 10<sup>th</sup> Floor, New York, NY 10016. <[www.sa-intl.org](http://www.sa-intl.org)>

<sup>48</sup> Sustainable Electronics Recycling International. PO Box 721, Hastings, MN 55033. <[sustainableelectronics.org/r2-standard](http://sustainableelectronics.org/r2-standard)>

<sup>49</sup> UL LLC. 33 Pfingsten Road, Northbrook, IL 60062. <[www.ul.com](http://www.ul.com)>

<sup>50</sup> Universiteit Leiden, Institute of Environmental Sciences. PO Box 9500, 2300 RA Leiden, The Netherlands. <[www.cml.leiden.edu](http://www.cml.leiden.edu)>

<sup>51</sup> US Department of Energy. 1000 Independence Avenue SW, Washington, DC 20585. <[www.energy.gov](http://www.energy.gov)> <https://www.energy.gov/eere/amo/50001-ready-program>

<sup>52</sup> US Environmental Protection Agency. 1200 Pennsylvania Avenue NW, Washington, DC 20004. [www.epa.gov](http://www.epa.gov); <https://www.epa.gov/ghgreporting/subpart-i-electronics-manufacturing>; [https://cfpub.epa.gov/si/si\\_public\\_record\\_report.cfm?Lab=NRML&dirEntryId=155087](https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NRML&dirEntryId=155087); <https://www.epa.gov/chemical-research/tool-reduction-and-assessment-chemicals-and-other-environmental-impacts-traci>

<sup>53</sup> The National Renewable Energy Laboratory or the U.S. Department of Energy, operated by the Alliance for Sustainable Energy, LLC, <https://www.nrel.gov/lci/>

382 US Securities Exchange Act of 1934, Rule 13p-1<sup>54</sup>

383

384

385

### 386 3 Terms and definitions

387

#### 388 3.1 Special terms, acronyms and abbreviations

389 **ASTM:** Refers to “ASTM International”, formerly the American Society for Testing and Materials

390 **BIOS:** basic input / output system

391 **CAS:** chemical abstract number

392 **CPU:** processor or central processing unit

393 **CSR:** corporate sustainability report

394 **DDR:** double data rate

395 **DIMMs:** dual in-line memory modules

396 **DIN:** German Institute for Standardisation (Deutsches Institut für Normung)

397 **DRC:** Democratic Republic of Congo

398 **DRE:** Destruction or Removal Efficiency

399 **EC:** European community number

400 **ECF:** elemental chlorine free

401 **ECMA:** Refers to “ECMA International”, formerly the European Computer Manufacturers Association

402 **EICC:** Electronic Industry Citizenship Coalition

403 **EMAS:** European Union Eco-Management and Audit Scheme

404 **EMI:** electromagnetic interference

405 **EMS:** environmental management system

406 **EnMS:** energy management system

407 **EPA:** Environmental Protection Agency

408 **ESD:** electrostatic discharge

409 **F-GHG:** fluorinated greenhouse gas

410 **GHG:** greenhouse gas

411 **GLEC:** Global Logistics Emissions Council

412 **GRI:** Global Reporting Initiative

413 **HTML:** hypertext markup language

414 **IAF:** International Accreditation Forum

415 **IEC:** International Electrotechnical Commission

416 **IEEE:** Institute of Electrical and Electronics Engineers

417 **IPSA:** independent private sector audit

418 **IATA:** International Air Transportation Association

419 **IMO:** International Maritime Organization

420 **ISO:** International Organization for Standardization

421 **LCA:** life cycle assessment

422 **LNE:** large network equipment

423 **OECD:** Organisation for Economic Co-operation and Development

424 **OS:** operating system

425 **PCR:** postconsumer recycled

426 **PCF:** processed chlorine free

427 **PDF:** portable document format

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<sup>54</sup> US Securities and Exchange Commission. 100 F Street, NE, Washington, DC 20549. <[www.sec.gov](http://www.sec.gov)>

428 **PSU:** power supply unit  
429 **QR:** quick response  
430 **SASB:** Sustainability Accounting Standards Board  
431 **SEC:** Securities and Exchange Commission  
432 **SNE:** small network equipment  
433 **TCF:** totally chlorine free  
434 **URL:** uniform resource locator  
435 **WEEE:** waste electrical and electronic equipment  
436 **XML:** extensible markup language  
437 **VAP:** validated audit process  
438

### 439 3.2 Definitions

440 **additives and fillers:** Substances or compounds such as pigments and stabilizers added to polymers  
441 to improve processing, properties and end use performance.

442 **article:** An object which during production is given a special shape, surface or design that determines  
443 its function to a greater degree than its chemical composition.<sup>23</sup>

444 **agent:** An entity acting on behalf of a manufacturer.  
445

446 **battery:** means any source of electrical energy generated by direct conversion of chemical energy and  
447 consisting of one or more primary battery cells (non-rechargeable) or consisting of one or more  
448 secondary battery cells (rechargeable).<sup>23</sup>  
449

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

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

454 **bulk packaging:** Single primary package used to ship more than one product.

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

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

461 **conflict free:** A product that does not contain minerals that directly or indirectly finance or benefit  
462 armed groups in the Democratic Republic of the Congo (DRC) or an adjoining country.<sup>54</sup>  
463

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

466 NOTE 2 — The term “armed group” means an armed group that is identified as perpetrators of serious human  
467 rights abuses in the annual Country Reports on Human Rights Practices under sections 116(d) and 502B(b) of the  
468 Foreign Assistance Act of 1961 (22 USC. 2151n(d) and 2304(b)) relating to the Democratic Republic of the Congo  
469 or an adjoining country.

470 **conflict minerals:**

471 — columbite-tantalite (coltan), cassiterite, gold, wolframite, or their derivatives, which are  
472 limited to tantalum, tin, and tungsten; and  
473 — any other mineral or its derivatives determined by the US Secretary of State to be financing  
474 conflict in the DRC or an adjoining country.<sup>54</sup>

475

476 **deinstalled:** Unplugged equipment that is destined for, or intended to be destined for, removal from  
477 a customer site.

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

481 **disclosure:** Information made available to the audience specified in criterion (e.g., purchasers,  
482 public, etc.).

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

486 **documentation:** Information to be provided at time of verification or certification.

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

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

491 **elemental chlorine free (ECF):** Packaging material produced with pulp from virgin content that has  
492 been bleached using a chlorine derivative such as chlorine dioxide (ClO<sub>2</sub>), but without the use of  
493 elemental chlorine (Cl) or has not been bleached with chlorine compounds.

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

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

498 **ENERGY STAR certified:** A product has been found to be in conformance with the  
499 ENERGY STAR Computer Servers eligibility criteria by an ENERGY STAR approved third-party  
500 certification body, and the product is listed on the ENERGY STAR Qualified Product List located at  
501 [www.energystar.gov](http://www.energystar.gov).

502 **environmental management system:** Part of the management system used to manage environmental  
503 aspects, fulfil compliance obligations, and address risks and opportunities.

504

505 NOTE 1 — **Management system:** Set of interrelated or interacting elements of an organization to establish  
506 policies and objectives and processes to achieve those objectives. A management system can address a single  
507 discipline or several disciplines (e.g., quality, environment, occupational health and safety, energy, financial  
508 management). The system elements include the organization's structure, roles and responsibilities, planning and  
509 operation, performance evaluation and improvement. The scope of a management system can include the whole  
510 of the organization, specific and identified functions of the organization, specific and identified sections of the  
511 organization, or one or more functions across a group of organizations.

512 NOTE 2 — **Environmental aspects:** Element of an organization’s activities or products or services that interacts or  
513 can interact with the environment.

514 **external enclosure:** The outside casing of the product that houses its components.

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

518 **feedstock:** Raw material used in a manufacturing process.

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

521 **final disposition:** The last facility or operation managing equipment and/or components and materials  
522 derived from them at which they either:

- 523 — cease to be a waste by being processed into materials that will be used directly in
- 524 manufacturing new products or processes; or
- 525 — have arrived for disposal and are finally disposed.

526

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

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

531

532 **impact assessment categories:** Classifications of human health and environmental effects caused by  
533 a product throughout its life cycle.

534

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

538

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

541

542 **large network equipment (LNE):** Network equipment that is mountable in a standard equipment  
543 rack, supports network management protocols (e.g. SNMP) and contain more than eleven (11)  
544 physical network ports and, or total aggregate port throughput greater than 12 Gb/s.<sup>55</sup>

545

546 **life cycle assessment (LCA):** Compilation and evaluation of the inputs, outputs, and the potential  
547 environmental impacts of a product system throughout its life cycle.

548

549 **manufacturer:** Any natural, legal person or entity who:

- 550 — manufactures a product;
- 551 — has a product designed or manufactured; or
- 552 — places a brand label on a ready-made product; and
- 553 — places it on the market under their own name or trademark.

554

---

<sup>55</sup> ENERGY STAR® [Large Network Equipment](#)



555 **market (in context of first placed on the market):** A product is placed on the market when it is made  
556 available for the first time on the market, i.e. when it is first supplied for distribution, consumption  
557 or use on the market in the course of a commercial activity, whether in return for payment or free of  
558 charge.<sup>23</sup>

559 **network equipment:** Devices whose primary function is to pass Internet Protocol traffic among  
560 various network interfaces/ports.<sup>56</sup>

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

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

565 NOTE — For the purposes of this Criteria Document, unless otherwise noted, the term “packaging” only applies  
566 to sales packaging or primary packaging, i.e., packaging that contains and protects, and is designed to deliver a  
567 product unit to the final user or customer, and does not include pallets or the mechanism such as nails, screws,  
568 and bolts that is used to temporarily attach primary packaging to pallets.

569 **packaging component:** Any individual assembled part of packaging such as, but not limited to, any  
570 interior or exterior blocking, bracing, cushioning, weatherproofing, exterior strapping, coatings,  
571 closures, inks, and labels.

572 **postconsumer recycled content:** Material generated by households or by commercial, industrial and  
573 institutional facilities, which can no longer be used for its intended purpose. This includes returns of  
574 material from the distribution chain.<sup>36</sup>

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

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

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

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

588 **processor:** See *central processing unit* (CPU).

589 **product:** Networking equipment within the scope of the most current version of ENERGY STAR®  
590 Program Requirements for Small Network Equipment (SNE) and Large Network Equipment (LNE) as  
591 applicable.<sup>57</sup>

592 **publicly available:** Obtainable to the public without restriction of access; for example, cannot  
593 require member only access. A requirement to provide a name and/or organization to obtain access  
594 is not considered a “restriction of access”.

---

<sup>56</sup> ENERGY STAR® [Large Network Equipment](#) and [Small Network Equipment](#) specifications.

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

597 **recycled content:** Proportion, by weight, of recycled material in a product or packaging.

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

601

602 **refurbishment:** Functional or aesthetic maintenance or repair of a product to restore to original or  
603 upgraded functional state.

604

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

607

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

609

610 **secure data deletion:** means the effective erasure of all traces of existing data from a data storage  
611 device, overwriting the data completely in such a way that access to the original data, or parts of  
612 them, becomes infeasible for a given level of effort.<sup>57</sup>

613 **small network equipment (SNE):** Network equipment that is designed for stationary operation,  
614 contains no more than eleven (11) wired physical network ports and is primarily configured for  
615 operation outside standard equipment racks.<sup>58</sup>

616

617 **supplier:** Entity that provides goods or services to the manufacturer.

618

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

621

622 **treatment:** Material recovery or disposal operations, including preparation prior to recovery or  
623 disposal.

624

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

627

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

629

630

## 631 Environment and Social Criteria

632

### 633 4 Reduction of Chemicals of Concern

634

#### 635 4.1 Reduction of substances of concern

636

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<sup>57</sup> Ecodesign Commission Regulation (EU) 2019/424

<sup>58</sup> ENERGY STAR® [Small Network Equipment](https://www.energystar.gov/products/spec/small_network_equipment_specification_version_1_0_pd) specification,  
[https://www.energystar.gov/products/spec/small\\_network\\_equipment\\_specification\\_version\\_1\\_0\\_pd](https://www.energystar.gov/products/spec/small_network_equipment_specification_version_1_0_pd)

637 4.1.1 Required – Conformance with provisions of European Union RoHS Directive

638 The product shall meet the substance restriction requirements of the European Union RoHS Directive  
639 and its amendments in effect on the date of product manufacture. All exemptions to the substance  
640 restrictions as defined by the Directive are applicable.

641

642 **Verification requirements:**

643

644 a) documentation of a conformance assurance process that demonstrates conformity to this  
645 criterion through effective control of the supply chain;

646 Or

647 b) technical documentation in accordance with EN 50581 or IEC 63000 as required by the  
648 European Union RoHS Directive.

649

650 **References and details:** The European Union RoHS Directive stipulates maximum concentration values  
651 (MCVs) by weight for the presence of each substance within homogeneous materials.

652 Technical documentation, as required in Article 7(b) of the European Union RoHS Directive, can be  
653 generated per Standard EN 50581, Technical documentation for the assessment of electrical and  
654 electronic products with respect to the restriction of hazardous substances or IEC 63000, Technical  
655 documentation for the assessment of electrical and electronic products with respect to the restriction  
656 of hazardous substances.

657

658 4.1.2 Required - Conformance with substance restriction requirements of the European  
659 Union Battery Directive

660 Batteries in the product shall meet the substance restriction requirements of the European Union  
661 Battery Directive in effect at the date of battery manufacture.

662

663 If the product does not contain batteries, “Not Applicable” may be declared.

664

665 **Verification requirements:**

666 a) list of batteries in the product, including their composition type (e.g. lithium ion, metal  
667 hydride, etc.)

668

669 b) at least one of the following:

670 i. test results demonstrating that battery(ies) in the product meets the substance  
671 requirements of the European Union Battery Directive;

672 ii. statement from the battery supplier indicating that the product meets the substance  
673 requirements of the European Union Battery Directive; or

674 iii. Material Declaration and Disclosure from the supplier.

675

676 **References and details:** This criterion only applies to those substances for which the European  
677 Union Battery Directive establishes threshold limits on the amount of the substance in batteries. This  
678 criterion does not apply to those substances only subject to the European Union Battery Directive  
679 labeling requirements.

680

681 4.1.3 Required - Reduction of Bromine and Chlorine content of plastic parts > 25 grams

682 Plastic parts exceeding 25 g shall not contain greater than 1000 ppm chlorine or greater than 1000  
683 ppm bromine<sup>59</sup>. Parts that exceed 25% postconsumer recycled content shall contain a maximum of  
684 5000 ppm chlorine and 5000 ppm bromine.

685

686 The following exceptions apply:

- 687 — printed circuit boards, cables and wiring, fans and electronic components.
- 688 — parts for which the manufacturer has performed an alternative assessment in accordance  
689 with requirements set forth in 4.2.5 Substance Hazard Assessment on the substance(s)  
690 responsible for exceeding the bromine and chlorine levels and demonstrates that the substance  
691 was determined to be safer than, or as safe as, the available alternatives.

692

693 If the product does not contain plastic parts > 25 g, “Not Applicable” may be declared.

694

695 **Verification requirements:**

696 a) a list of plastic parts exceeding 25 g.

697

698 b) documentation that each plastic part exceeding 25 g meets one of the four options below:

699 i. test data showing that the part contains less than 1000 ppm chlorine and less than  
700 1000 ppm bromine by an applicable test method that is included in the laboratory’s  
701 ISO 17025 scope of accreditation. Applicable test methods include, but are not  
702 limited to, IEC 62321-3-1 and IEC 62321-3-2.

703 Or

704 ii. documentation of a conformance assurance process that demonstrates conformity  
705 to this criterion through effective control of the supply chain;

706 Or

707 iii. if the part contains greater than 25% PCR:

708 — supplier letter supporting the greater than 25% PCR;

709 — test data showing that the part contains less than 5000 ppm chlorine and less  
710 than 5000 ppm bromine;

711 Or

712 — documentation of a conformance assurance process that demonstrates  
713 conformity to this criterion through effective control of the supply chain;

714 Or

715 iv. demonstration that an alternative assessment was conducted, using the  
716 methodology outlined in 4.2.5 on the substance responsible for the observed  
717 bromine and/or chlorine levels and the possible alternatives and the substance was  
718 determined to be safer than, or as safe as, the available alternatives.

719

720 **References and details:** None

721

722 4.1.4 Optional - Further reduction of Bromine and Chlorine content of plastic parts > 25  
723 grams

724 Plastic parts exceeding 25 g shall not contain greater than 1000 ppm chlorine or greater than 1000  
725 ppm bromine, in accordance with Table 4.1.4, with the following exception:

---

<sup>59</sup> Based on chlorine and bromine thresholds specified in IEC 62474 Material declaration for products of and for the electrotechnical industry.

726 — parts which exceed 25% postconsumer recycled content may contain a maximum of 5000 ppm  
727 chlorine and a maximum of 5000 ppm bromine.

728

729 If the product does not contain plastic parts > 25 g, “Not Applicable” may be declared.

730

731

**Table 4.1.4**

732

Plastic parts	Points
At least one of the following: — printed circuit board laminates (excluding components soldered or affixed to the printed circuit board) — fans	1
All plastic parts > 25 g	1

733

734 **Point value:** 1 or 2

735

736 **Verification requirements:**

737 a) a list of plastic parts exceeding 25 g

738

739 b) documentation that plastic parts per Table 4.1.4 exceeding 25 g meets one of the three  
740 options below:

741 i. test data showing that the part contains less than 1000 ppm chlorine and less  
742 than 1000 ppm bromine by an applicable test method that is included in the  
743 laboratory’s ISO 17025 scope of accreditation. Applicable test methods include,  
744 but are not limited to, IEC 62321-3-1 and IEC 62321-3-2.

745 Or

746 ii. documentation of a conformance assurance process that demonstrates  
747 conformity to this criterion through effective control of the supply chain;

748 Or

749 iii. if the part contains greater than 25% PCR:

750 — supplier letter supporting the greater than 25% PCR

751 — test data showing that the part contains less than 5000 ppm chlorine  
752 and less than 5000 ppm bromine;

753 Or

754 — documentation of a conformance assurance process that demonstrates  
755 conformity to this criterion through effective control of the supply  
756 chain.

757

758 **References and details:** None

759

760 **4.1.5 Required - Conformance with supply chain communication provisions of European  
761 Union REACH Regulation**

762 Manufacturer shall disclose in accordance with the Article 33 requirements of the European Union  
763 REACH Regulation in effect at the time the product is declared to conform to this Criteria Document.

764

765

766 **Verification requirements:**

- 767 a) disclosure of substances on REACH candidate list present in any article in the product above  
768 the threshold, as applicable.  
769

770 **References and details:** European Union Regulation (EC) No 1907/2006  
771

#### 772 4.1.6 Optional - Reduction of substances on the European Union REACH Regulation Annex 773 XIV (authorization list)

774 The product shall not contain applicable substances on the European Union REACH Annex XIV (List of  
775 Substances Subject to Authorization) above 0.1% per substance by weight per “article”, or specified  
776 threshold in Annex XIV. Applicable substances are those on the REACH Authorization List (Annex XIV)  
777 after their respective sunset dates specified in Annex XIV at the date of product manufacture.  
778

779 In order to identify substances that may be constituents of electronics, manufacturers may pre-  
780 screen the European Union REACH Annex XIV using IEC 62474 Material Declaration for Products of  
781 and for the Electrotechnical Industry.  
782

783 Manufacturer shall utilize a conformance assurance process to ensure that the product does not  
784 contain applicable substances above 0.1% by weight per “article”.  
785

786 **Point value:** 1  
787

#### 788 **Verification requirements:**

- 789 a) method for determining applicable substances.  
790  
791 b) documentation of a conformance assurance process that demonstrates conformity to this  
792 criterion through effective control of the supply chain.  
793

794 **References and details:** IEC 62474 declarable substances and groups.  
795  
796

## 797 4.2 Inventory and assessment of substances

798

### 799 4.2.1 Optional – Record of declarable substances

800 Manufacturer shall record the presence of IEC 62474 declarable substance groups and declarable  
801 substances in the product at or above the reporting threshold amounts stated in the IEC 62474  
802 database at the time the product is declared to conform to this Criteria Document. The record shall  
803 include all declarable substance groups and declarable substances designated criteria 1, 2 and 3 in  
804 the IEC 62474 database.  
805

806 The manufacturer shall have one or both of the following:

- 807 — a process to manage, maintain, and update all data received on declarable substances listed  
808 in IEC 62474.  
809 — a conformance assurance process used to ensure that the product does not contain these  
810 substances.  
811

812 The criterion does not require public disclosure.  
813

814 **Point value:** 1

815

816 **Verification requirements:**

817

818 a) record of IEC 62474 declarable substance groups and declarable substances (designated 1, 2,  
819 and 3) in the product at or above the reporting threshold.

820

821 b) documentation of a process to manage, maintain and update data received on declarable  
822 substances listed in IEC 62474.

823 Or

824 c) documentation of a conformance assurance process that demonstrates conformity to this  
825 criterion through effective control of the supply chain.

826

827 **References and details:** IEC 62474 declarable substances and groups.

828

829 **4.2.2 Optional - Disclosure of declarable substances**

830 Manufacturer shall make publicly available on their website the record of IEC 62474 declarable  
831 substance groups and declarable substances in the product. The inventory shall contain the CAS  
832 number for each declarable substance (not including declarable substance groups). The link to the  
833 record shall be placed on the product specification or documentation web page. The URL for the  
834 manufacturer's public website disclosing this information shall be provided during product  
835 registration, certification or self-declaration, and made publicly available.

836

837 **Point value:** 1

838

839 **Verification requirements:**

840 a) URL of the public disclosure.

841

842 b) record generated for conformance with Criterion 4.2.1, that:

843 i. includes the CAS number for each declarable substance, and

844 ii. is located on the product specification or documentation web page.

845

846 **References and details:** None

847

848 **4.2.3 Optional - Requesting full substance inventory**

849 The manufacturer shall request (or otherwise have access to) information from suppliers on the  
850 inventory of substances in the substances, components, and parts contained in the product. The  
851 supplier requests shall cover either:

852 — materials, components, and parts encompassing at least 90% of the total product mass, or

853 — at least 90% of the directly contracted suppliers of substances, components, and parts.

854

855 The manufacturer shall have a documented process, and a system or tool, to record the collected  
856 information, and to calculate the percentages stated above.

857

858 Manufacturer shall request suppliers to disclose the standardized number (e.g. CAS, EC, MITI), for  
859 the inventory of substances.

860

861 "Request" means one or more of the following:

- 862 — the manufacturer, or an agent or supplier of the manufacturer, has requested this information in  
 863 writing from the supplier directly (e.g. email, letter); or  
 864 — a contract, agreement, or purchase order between the supplier and the manufacturer (or  
 865 between the supplier and an intermediary supplier [e.g. contract manufacturer]) requires the  
 866 supplier to provide this information; or  
 867 — a specification or other document to which the supplier is held by the manufacturer or an  
 868 intermediary supplier that requests this information.

869

870 **Point value: 1**

871

872 **Verification requirements:**

873

874 a) documentation of process for collecting the information requested in accordance with this  
 875 criterion.

876

877 b) documentation of process for an information management system or tool adequate to  
 878 address the nature and quantity of parts, suppliers and information relevant to the  
 879 requested substance information.

880

881 c) summary of information used to calculate percentages achieved of requested information  
 882 from suppliers.

883

884 **References and details: None**

885

#### 886 4.2.4 Optional - Acquiring substance inventory

887 The manufacturer shall demonstrate that it has in the system or tool required in 4.2.1, a complete  
 888 list of the substances in the products/components supplied to the manufacturer from its suppliers,  
 889 as specified in the table below.

890

891 The following equation shall be used to calculate the percentage:

892

$$893 \quad \% \text{ mass of inventory of substances of the product} = \frac{\text{Mass of substances inventoried}}{\text{Total mass of the product}} \times 100$$

894

895 In the calculation, only the portion of materials, components, and parts for which substance  
 896 inventory information is received from the supplier shall be counted in the numerator. If a supplier  
 897 withholds disclosure on the basis of confidential business information, the mass of the undisclosed  
 898 substances shall not be included in the numerator.

899

900 For instances where there are multiple suppliers for a given material, component, or part, at a  
 901 minimum the manufacturer shall select which inventoried supplier mass(es) to include in the  
 902 calculation.

903

904 Manufacturer may claim the points associated with only one level in Table 4.2.4

905

906

**Table 4.2.4**

Data acquired on substance inventory	Points
Minimum of 75% of total product mass	1
Minimum of 90% of total product mass	2



907  
908 The manufacturer shall have a system for validating reports or other substance ingredient  
909 declarations from its suppliers.  
910

911 **Point value:** 1 or 2

912 **Verification requirements:**

- 913 a) documentation that the system or tool utilized, includes a complete list of the substances in  
914 the products/components supplied to the manufacturer from its suppliers  
915  
916 b) calculation demonstrating the percentage of total product mass for which the manufacturer  
917 has a complete list of the substances  
918  
919 c) evidence supporting the existence of a system for validating reports or other substance  
920 ingredient declarations from its suppliers.  
921

922 **References and details:** None

#### 923 924 4.2.5 Optional – Substance hazard assessment

925  
926 Manufacturer shall demonstrate that a hazard assessment has been conducted using a comparative  
927 hazard assessment tool on each substance that serves the following functions in the product and  
928 provide the hazard assessment summary table or score assigned.  
929

- 930 1) flame retardants  $\geq 0.1\%$  by weight in homogenous materials of plastic parts  $\geq 25$  g  
931 2) plasticizers  $\geq 0.1\%$  by weight in homogenous materials of plastic parts  $\geq 25$  g  
932

933 Exclusions: The manufacturer may exclude flame retardants and plasticizers used in the following  
934 parts from this requirement for conducting hazard assessments: printed circuit boards, cables, wires,  
935 connectors, fans and power supplies.  
936

937 The manufacturer shall only use hazard assessments completed no more than 5 years prior to when  
938 the product is declared conformant to this criterion and the assessment methodology utilized must  
939 be made available for third-party peer review.  
940

941 Assessments shall be performed by assessors with the following qualifications<sup>60</sup>:

- 942 — a degree in chemistry, chemical engineering, biology, toxicology, environmental sciences, or  
943 related fields relevant to the subject matter in the assessment.  
944 — received training in conducting hazard assessments, provided by recognized experts in  
945 conducting such assessments.  
946

947 The assessments shall include the following information:

- 948 — name of assessor.  
949 — documentation of the assessor qualifications listed above.

---

<sup>60</sup> Clean Production Action Licensed GreenScreen® Profilers and Authorized GreenScreen® Practitioners meet this requirement.

- 950 — indication of whether the assessment has been verified by the applicable verification  
951 program.  
952 — date of the assessment and date of expiration.  
953 — level of ingredient disclosure and reporting in the assessments.  
954 — demonstration that the assessment considers product end of life management.

955

956 Optional Points are assigned based on the hazard assessment of the substances used to serve the  
957 functions above and are to be awarded as follows (maximum 2 points total):

958

959

**Table 4.2.5**

Performance	Total points earned
Substances are not in the highest hazard category; examples include, but not limited to: <ul style="list-style-type: none"> <li>• GreenScreen® - not Benchmark 1</li> <li>• Scivera's GHS+ Chemical Hazard Assessment - not Hazard Category Red</li> <li>• Cradle to Cradle Certified™- not x-CMR or x-PBT</li> </ul>	1
Substances are not in the two highest hazard categories; examples include, but not limited to: <ul style="list-style-type: none"> <li>• GreenScreen®- not Benchmark 1 or 2</li> <li>• Scivera's GHS+ Chemical Hazard Assessment - not Hazard Categories Red or Yellow</li> <li>• Cradle to Cradle Certified™- not rated x for any combination of hazard ratings</li> </ul>	2

960

961

For products that do not contain individual plastic parts containing flame retardants or plasticizers weighing greater than or equal to 25 g, other than the above stated exclusions, the manufacturer may declare "Not Applicable" for this criterion.

962

963

964

**Point value:** 1 or 2

965

966

967

**Verification requirements:**

968

969

970

971

972

973

974

975

976

977

978

979

980

- a) list of applicable plastic parts >25 g and the flame retardant and plasticizer substances used and their hazard assessment score.
- b) demonstration that each of those substances have:
  - i. been assessed by an assessor with the qualifications listed in the criterion;
  - Or
  - ii. publicly available assessments such as those available on the Clean Production Action website<sup>61</sup> or the Interstate Chemicals Clearinghouse Chemical Hazard Assessment Database (IC2)<sup>62</sup> Pharos<sup>63</sup>, or ChemForward<sup>64</sup>.
- c) demonstration that the assessments contain the information as required in the criterion.

**References and details:** None

<sup>61</sup> Clean Production Action. 1310 Broadway, Suite 101 Somerville, MA 02144 <[www.greenscreenchemicals.org](http://www.greenscreenchemicals.org)>

<sup>62</sup> Interstate Chemicals Clearinghouse. 89 South Street, Suite 600 Boston, MA 02111-2651 <[www.theic2.org](http://www.theic2.org)>

<sup>63</sup> Pharos. 1710 Connecticut Ave NW, 4th Floor Washington DC 20009 <[pharosproject.net](http://pharosproject.net)>

<sup>64</sup> ChemForward. <<https://www.chemforward.org/alternatives>>

981

## 982 4.2.6 Optional - Making safer substance use hazard assessments publicly available

983 The manufacturer shall publicly disclose the hazard assessment results in accordance with  
984 criterion 4.2.5.

985

986 The URL for the public website disclosing this information shall be provided during product  
987 registration, certification or self-declaration, and made publicly available.

988

989 **Point value: 1**

990

991 **Verification requirements:**

992 a) URL of public disclosure on the manufacturer or other public website.

993

994 b) public disclosure of the hazard assessment results in accordance with criterion 4.2.5.

995

996 **References and details: None**

997

998

## 999 4.3 Reduction of substances of concern in packaging

1000

## 1001 4.3.1 Required – Elimination of added heavy metals in packaging

1002 Heavy metals – lead, cadmium, mercury, and hexavalent chromium – shall not be intentionally  
1003 added to any package or packaging component. For incidental presence, the sum of the combined  
1004 concentrations of lead, cadmium, mercury, and hexavalent chromium present in any packaging  
1005 component shall not exceed 100 ppm by weight.

1006 Pallets are excluded for the purposes of this criterion.

1007 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
1008 which the product is declared to conform to this Criteria Document. The approach used to conform  
1009 to this criterion may vary by country or region.1010 **Verification requirements:**1011 a) supplier statement for each packaging component or packaging material provided by the  
1012 supplier that includes:1013 i. the specified heavy metals have not been intentionally added to any package or  
1014 packaging component;

1015 And

1016 ii. the sum of the combined concentration of the four metals present in any packaging  
1017 component does not exceed 100 ppm by weight.

1018 OR

1019 b) documentation of a conformance assurance process (CAP) that demonstrates conformity to  
1020 this criterion through effective control of the supply chain.

1021 **References and details:** The requirements in this criterion are based on Model Toxics in Packaging  
1022 legislation, European Parliament and Council Directive 94/62/EC and California Health and Safety  
1023 Code Section 25214.11-25214.26.

1024 Analytical testing of the packaging for the product declared to conform to this Criteria Document is  
1025 not required for verification to this criterion. However, it is implied that supplier statements or  
1026 manufacturer programs are based on a conformance assurance system that includes periodic  
1027 analytical testing.

1028  
1029 **4.3.2 Required—Restriction on the use of elemental chlorine as a bleaching agent in paper-**  
1030 **based packaging material**

1031  
1032 Manufacturer shall state in the manufacturer’s environmental packaging requirement that  
1033 elemental chlorine shall not be used as a bleaching agent to bleach virgin or recovered content  
1034 fibers used in paper-based product packaging.

1035 Product packaging that is made Elemental Chlorine Free (ECF), Total Chlorine Free (TCF), or  
1036 Processed Chlorine Free (PCF) meets the requirements of this criterion.

1037 Additionally, recycled content that may have been previously bleached with chlorine or chlorine  
1038 derivatives meets the requirements of this criterion.

1039 **Verification requirements:**

1040 a) copy of manufacturer’s environmental packaging requirement as provided to packaging  
1041 supplier.

1042 **References and details:** None.

1043  
1044 **4.3.3 Optional – Restriction on the use of chlorine compounds in processing packaging**  
1045 **materials**

1046 Manufacturer shall document that any fiber-based materials (virgin or recovered) used in packaging  
1047 was not bleached with chlorine compounds. Unbleached packaging is also eligible for this optional  
1048 point. This requirement applies to the bleaching of fiber-based materials and their fabrication into  
1049 packaging for server products declared to conform to this Criteria Document. The use of recovered  
1050 fibers that were previously bleached is acceptable.

1051 **Point value:** 1

1052 **Verification requirements:**

1053 a) documentation that fiber-based materials are not bleached with chlorine compounds (e.g.,  
1054 supplier letter or supplier data submission to manufacturer). Documentation that packaging  
1055 is made Total Chlorine Free (TCF) or Processed Chlorine Free (PCF) meets this verification  
1056 requirement.

1057 **References and details:** None.

1058

## 1059 5 Sustainable Use of Resources

1060

### 1061 5.1 Product recycled content

1062

#### 1063 5.1.1 Required - Declaration of postconsumer recycled plastic content

1064 Manufacturer shall declare the minimum percentage of plastic derived from the use of  
1065 postconsumer recycled plastic in plastic parts in the product. Individual parts greater than or equal  
1066 to 25 g shall be included in the calculation. The manufacturer may choose to include individual parts  
1067 less than 25 g in the calculation.

1068

1069 The declaration shall be provided either

1070 1) on a publicly available registry; or

1071 2) on the third-party certification organization website or manufacturer's website in the form of  
1072 a certification report, or equivalent, issued by the certifying organization; or

1073 3) on the manufacturer's website, if the product is self-declared to conform to the Criteria  
1074 Document.

1075

1076 Calculation: The minimum percentage is calculated as the minimum weight of postconsumer  
1077 recycled resins in the included plastic parts (numerator) divided by the total weight of all included  
1078 plastic parts (denominator). Only the weight of postconsumer recycled content in the commercial  
1079 resin shall be included in the numerator.

1080

1081 Additives or fillers in plastic formulations shall not contribute to the weight of recycled content,  
1082 except in the case where the additives or fillers are derived from a recycled feedstock.

1083

1084 Exclusions: The manufacturer may also exclude any of the following items from the calculation:  
1085 printed circuit boards, labels, cables, connectors, electronic components, optical components,  
1086 electrostatic discharge (ESD) components, electromagnetic interference (EMI) components, fans,  
1087 and biobased plastic content.

1088

1089 For products that do not contain individual plastic parts weighing greater than or equal to 25 g, the  
1090 manufacturer may declare "Not Applicable" for this criterion.

1091

#### 1092 **Verification requirements:**

1093 a) supplier documentation stating minimum percentage of postconsumer recycled plastic  
1094 content in material supplied to manufacturer or to manufacturer's part supplier.

1095

1096 b) documentation of a calculation that includes a list of the included plastic component part  
1097 name(s) or other part identifier that contains the postconsumer recycled plastic content,  
1098 weight (g) of postconsumer recycled plastic in the component part, and postconsumer  
1099 recycled plastic resin type. If the part identifier is not descriptive, a description of the type of  
1100 part shall be provided.

1101

1102 **References and details:** None

1103

#### 1104 5.1.2 Optional- Minimum Postconsumer recycled content in external enclosures for SNE

1105 External enclosure of Small Network Equipment shall consist of a minimum 5% postconsumer  
1106 recycled (PCR) plastic content. External enclosure parts < 50 g may be excluded from this

1107 requirement. For the purpose of this criterion, bezels, latches, brand badges, labels, and mounting  
1108 brackets are not considered part of the enclosure.

1109

1110 Calculation: The minimum percentage is calculated as the minimum weight of postconsumer  
1111 recycled resins in the included plastic parts (numerator) divided by the total weight of all included  
1112 plastic parts (denominator). Only the weight of postconsumer recycled content in the commercial  
1113 resin shall be included in the numerator.

1114

1115 Additives or fillers in plastic formulations shall not contribute to the weight of recycled content,  
1116 except in the case where the additives or fillers are derived from a recycled feedstock.

1117

1118 For products that do not contain individual plastic parts weighing greater than or equal to 50 g, the  
1119 manufacturer may declare “Not Applicable” for this criterion.

1120 **Point value: 1**

1121

1122 **Verification requirements:**

1123 a) supplier documentation stating minimum percentage of postconsumer recycled plastic  
1124 content in material supplied to manufacturer or to manufacturer's part supplier.

1125

1126 b) list of the included plastic component part name(s) or other part identifier that contains the  
1127 postconsumer recycled plastic content, weight (g) of postconsumer recycled plastic in the  
1128 component part, and postconsumer recycled plastic resin type. If the part identifier is not  
1129 descriptive, a description of the type of part shall be provided.

1130

1131 **References and details: None**

1132

1133 **5.1.3 Optional - Postconsumer recycled content of rare earth elements in hard drive(s) in**  
1134 **product**

1135 Products that contain a hard drive(s) with actuator / voice coil or spindle magnets shall contain 5%  
1136 or more PCR content neodymium or dysprosium by weight of neodymium or dysprosium in the  
1137 magnet. The neodymium or dysprosium shall be provided through the recycling of magnets from  
1138 used devices, not limited to electronic devices.

1139 If the product does not contain a hard drive with magnets that contain these rare earth elements,  
1140 “Not Applicable” may be declared.

1141 **Point value: 2**

1142 **Verification requirements:**

1143 a) evidence from hard drive manufacturer(s) that the magnets in the hard drives contain 5% or  
1144 more PCR content neodymium or dysprosium and documentation of its source through  
1145 means such as one or more of the following:

1146 i. documentation of audits of magnet suppliers and purchasing records.

1147 ii. identification of the source(s) material type of recovered rare earth elements (does not  
1148 require disclosure of supplier).

1149 iii. certification attesting to the minimum PCR content of neodymium or dysprosium using  
1150 UL 2809 Environmental claim validation procedure (ECVP) or equivalent chain-of-  
1151 custody procedure.

1152

1153 **References and details:** None

1154

1155 **5.2 Resource efficiency of product packaging**

1156

1157 **5.2.1 Required - Enhancing recyclability of packaging materials**

1158 Product packaging shall meet the following requirements:

1159 a) all non-reusable packaging components  $\geq 25$  g shall be separable by material type, including  
1160 by plastic material type as specified in b) below, using only commonly available tools. The  
1161 following are exempt from this requirement: plastic parts smaller than 50 cm<sup>2</sup>, labels affixed  
1162 to plastics bags or wraps, tape, staples, co-laminated materials for purposes of moisture or  
1163 ESD barrier protection, and plastic bags over expanded foam.

1164

1165 b) all plastic packaging components  $\geq 25$  g shall be clearly marked with material type in  
1166 accordance with ISO 11469/1043<sup>65</sup>, ASTM D7611/D7611M<sup>66</sup>, or DIN6120<sup>67</sup> or equivalent  
1167 markings relevant to the geographic location in which the product is being sold. The  
1168 following are exempt from this requirement: plastic protective films, stretch wraps,  
1169 strapping, and expanded polyurethane foam. For products with packaging that does not  
1170 contain any plastic components, manufacturer may declare “Not applicable” for  
1171 requirement b) in this criterion.

1172 **Verification requirements:**

1173 a) documentation from manufacturer:

- 1174 i. for requirement a) manufacturer’s packaging part or assembly/disassembly drawing, or  
1175 photographs.  
1176 ii. for requirement b) photographs or physical evidence of plastic markings.

1177 **References and details:** None

1178

1179 **5.2.2 Required - Recycled fiber in corrugated packaging**1180 Corrugated fiber-based packaging materials shall contain a minimum of 25% recycled fiber content  
1181 (by fiber weight).

1182

1183 If the product packaging does not contain corrugated fiber-based materials, “Not Applicable” may be  
1184 declared.

---

<sup>65</sup> International Organization for Standardization. Chemin de Blandonnet 8, Case Postale 401, 1214 Vernier, Geneva, Switzerland. [www.iso.org](http://www.iso.org)

<sup>66</sup> ASTM D7611/D7611M-20, <https://www.astm.org/Standards/D7611.htm>

<sup>67</sup> DIN 6120:2019, Marking of packaging and packaging materials, [https://infostore.saiglobal.com/en-us/Standards/DIN-6120-2019-378508\\_SAIG\\_DIN\\_DIN\\_2710377/](https://infostore.saiglobal.com/en-us/Standards/DIN-6120-2019-378508_SAIG_DIN_DIN_2710377/)

1185 **Verification requirements:**

- 1186 a) list of applicable packaging materials and weights.  
1187  
1188 b) supplier documentation with recycled content percentage from each applicable packaging  
1189 material where recycled content percentage is claimed from suppliers.

1190 **References and details:** None

1191

1192 **5.2.3 Optional – Higher recycled fiber content in corrugated packaging for LNE**

1193 Corrugated packaging materials shall contain at least 50% recycled content calculated as an  
1194 average. Manufacturers shall also state a preference in specifications, which are applicable to the  
1195 product, for a minimum 25% postconsumer recycled fiber content (by fiber weight). Fiber-based  
1196 packaging materials derived from alternative sources to traditional paper mill products are exempt  
1197 from this recycled fiber requirement and shall not be included in the calculation of recycled  
1198 content.

1199

1200 **Point value:** 1

1201

1202 **Geographic applicability:** A manufacturer may declare this Criteria Document differently in each  
1203 country or region for which the product is declared to conform to this Criteria Document.

1204

1205 **Verification requirements:**

- 1206 a) list of applicable packaging materials and weights.  
1207  
1208 b) supplier documentation with average recycled content percentage from each applicable  
1209 packaging material where recycled content percentage is claimed from suppliers.  
1210  
1211 c) documentation to supplier indicating minimum average recycled content.

1212

1213 **References and details:** Examples of alternative sources include, but are not limited to, bamboo  
1214 and mushrooms.

1215

1216 **5.2.4 Optional – Bulk packaging for SNE**

1217

1218 Manufacturer shall offer a bulk packaging option to institutional customers that reduces the amount  
1219 of packaging:

- 1220 — by bulk packaging weight, as compared on a per unit basis to the single unit packaging; or  
1221 — by bulk packaging volume, as compared on a per unit volume basis to single unit packaging.

1222

1223 The bulk packaging option shall be offered to institutional customers through the same ordering  
1224 process as typically used by institutional purchasers.

1225 Bulk packaging shall function as the primary packaging from the point of final assembly of the  
1226 product through delivery to the institutional customer. Re-boxing of a finished product from single  
1227 unit packaging to bulk packaging does not meet the requirements of this criterion.

1228



1229 Manufacturer may declare “Not Applicable” for a region or country if bulk packaging for the product  
1230 is prohibited by law.

1231 **Point value:** 1

1232

1233 **Verification requirements:**

1234

1235 a) engineering specification or schematic for the bulk packaging option(s).

1236

1237 b) demonstration that bulk packaging option(s) is offered to institutional customers as an  
1238 alternative to single unit packaging in the primary ordering process used by institutional  
1239 purchasers. Demonstration may include, for example, marketing materials, customer order  
1240 form, screenshot of an order screen, or sales contract.

1241

1242 c) to demonstrate reduction in packaging mass or volume, the manufacturer shall:

1243 i. define a base packaging configuration for a single unit of the registered product  
1244 (including external components as determined by the manufacturer).

1245 ii. define a bulk packaging configuration for shipping multiple units of the registered  
1246 product (including any external components as determined by the manufacturer in the  
1247 bullet above).

1248 iii. calculations demonstrating that the bulk package has a lower mass or volume of  
1249 packaging on a per unit basis as compared to the single unit packaging such that:

1250

$$1251 \frac{\textit{Total mass or total volume of bulk packaging}}{\textit{quantity of product units contained in the packaging}} < \frac{\textit{total mass or total volume of the single unit}}{\textit{unit}}$$

1252

1253 d) statements from the party that applies the bulk packaging at the point of final product  
1254 assembly, and the party that ships the product in the bulk packaging to the institutional  
1255 customer, if different, or other documentation demonstrating that the bulk packaging is the  
1256 primary packaging at point of final product assembly and shipment to customer, and that  
1257 the product(s) is not re-packaged from a single unit packaging.

1258

1259 e) documentation of law prohibiting bulk packaging, if applicable.

1260

1261 **References and details:**

1262 Total volume calculations should be determined by the outer dimensions of the packaging (e.g., bulk  
1263 packaging or single unit packaging.)

1264

1265 A packaging “configuration” is the combination of packaging materials and how they are assembled  
1266 (configured) to contain product(s).

1267 The manufacturer determines:

1268 a) the bulk packaging option(s) (for example, the number of product units per single bulk  
1269 packaging) for products declared to conform to this criterion. the bulk packaging option(s) can  
1270 vary by product type. the bulk packaging option(s) may include the shipment of 2 or more  
1271 units of 2 or more different product types.

1272 b) which external components that are included in the packaging for both the single unit base  
1273 packaging configuration and the base bulk packaging configuration. the only stipulation that

1274 the single unit packaging and the bulk packaging have the same included external  
1275 components.  
1276

### 1277 5.2.5 Optional – Recycled content paper-based packaging for SNE

1278  
1279 Paper-based packaging materials shall contain a minimum 65% recycled content fiber (by fiber  
1280 weight). Paper-based packaging materials derived from alternative sources to traditional paper mill  
1281 products (including, but not limited to, bamboo, mushrooms, bagasse and straw) are exempt from  
1282 this recycled fiber requirement and shall not be included in the calculation of recycled content.  
1283

1284 A manufacturer may declare this criterion differently in each country or region for which the product  
1285 is declared to conform to this Criteria Document.

1286

1287 **Point value:** 1

1288

1289 **Verification requirements:**

1290 a) list of applicable packaging materials and weights; and

1291

1292 b) supplier documentation with recycled content percentage for each applicable packaging  
1293 material.

1294

1295 **References and details:** None

1296

## 1297 5.3 Design for repair, reuse and recycling

1298

### 1299 5.3.1 Required – Design for repair, reuse and recycling

1300 The product shall be designed with the following features to facilitate repair, preparation for reuse,  
1301 recycling, and safe handling, unless otherwise required as part of compliance with safety regulations,  
1302 safety standards or as part of a safety certification:

1303 — external enclosures, or those portions of the enclosures that must be removed  
1304 to accomplish repair, reuse, recycling or safe handling, shall be removable by  
1305 hand or with commonly available tools, without destruction of the enclosure;

1306 — components requiring selective treatment listed in the European Union  
1307 WEEE Directive 2012/19/EU Annex VII shall be identified and removable by  
1308 hand or with commonly available tools;

1309 — at a minimum, if present in the product, data drives or cards, memory  
1310 DIMMs, internal power supply, hard disc drive (HDD), mass storage module  
1311 (SSD, etc.), fans, rechargeable batteries, and I/O cards, shall be replaceable  
1312 by hand or with commonly available tools; and

1313 — wires and cables that connect to external sources of power or data shall be  
1314 removable from the products by hand or with commonly available tools  
1315 without cutting either the wire or cable, or the product being rendered  
1316 unusable, unless required for technical or safety reasons.

1317

1318 In order for a component to be considered “identified” for the purposes of this criterion either the  
1319 component shall be called out in the product documentation called for in criterion 5.4.1,

1320 Information and reporting in preparation for reuse and recycling or marked with a visual display  
1321 as called for in 5.4.3, Product marked to identify components and materials requiring selective  
1322 treatment.

1323 **Verification requirements:**

- 1324
- 1325 a) documentation that the product meets each of the required design features to facilitate  
1326 repair, preparation for reuse, recycling, and safe handling.
- 1327
- 1328 b) if one or more of the required features is not included in the product design, justification  
1329 that this is due to compliance with safety regulations, safety standards or as part of a  
1330 safety certification.

1331

1332 **References and details:** None

1333

1334

1335 **5.3.2 Required – Design for plastics recycling**

1336 All plastic parts >100 g shall meet the following requirements:

- 1337
- 1338 — clearly marked with material type in accordance with ISO 11469/1043;
  - 1339 — separable by hand or with commonly available tools, such that plastic parts can be  
1340 separated into “compatible” or “compatible with limitations” material types, per Annex B in  
1341 ECMA-341 Environmental Design Considerations for ICT & CE Products, 4th Edition /  
1342 December 2010. If a plastic part is made up of more than one resin, and “good  
1343 compatibility” or “limited compatibility” cannot be determined because one or more of the  
1344 resins is not reflected in ECMA-341 Annex B, the manufacturer shall demonstrate that the  
1345 plastic part is compatible with recycling.

1346

1347 Printed circuit boards, connectors, wire and cables are excluded from this requirement.  
1348 If the product does not contain plastic parts weighing >100 g, “Not Applicable” may be declared.

1349

1350 NOTE — For components containing plastic parts, the 100 g threshold applies to the plastic part  
1351 only.

1352

1353 **Verification requirements:**

- 1354
- 1355 a) documentation stating each part number or name for plastic parts >100 g.
- 1356
- 1357 b) visual documentation such as photos documenting material type marking on each plastic  
1358 part >100 g.
- 1359
- 1360 c) provide instruction or diagram for separation of the plastic parts by hand or with commonly  
1361 available tools, including a list of commonly available tools needed, if any.

1362

1363 **References and details:** None

1364

1365

1365 **5.3.3 Optional – Further design for plastics recycling**

1366 Plastic parts > 50 g for SNE and >100 g for LNE, with the exception of printed circuit boards,  
1367 connectors, wire and cables, shall not have:

1368

- 1369 — molded, glued or otherwise attached metal inserts or metal fasteners, unless the metal  
1370 component can be completely snapped off manually or entirely removed with commonly  
1371 available tools; and  
1372  
1373 — adhesives, coatings, paints, or finishes that have a significant impact on the physical or  
1374 mechanical properties of the plastic when it is recycled.  
1375

1376 If the product does not contain plastic parts weighing >50 g for SNE and >100 g for LNE, “Not  
1377 Applicable” may be declared.  
1378

1379 **Point value: 1**

1380

1381 **Verification requirements:**

1382

1383 a) documentation stating each part number or name for plastic parts >50 g for SNE and >100 g  
1384 for LNE.

1385

1386 b) documentation that each plastic part >50 g for SNE and >100 g for LNE meets the  
1387 requirements of bullet 1 in the criterion. If the product contains molded, glued or otherwise  
1388 attached metal inserts or metal fasteners, a letter from a recycler confirming that the metal  
1389 components can be completely snapped off manually or entirely removed with commonly  
1390 available tools is an option to demonstrate conformity.

1391

1392 c) documentation that each plastic part >50 g for SNE and >100 g for LNE meets the  
1393 requirements of bullet 2 in the criterion including either:

1394 i. test results showing no more than a 25% reduction in either the notched Izod impact  
1395 at room temperature between a test sample made from the original plastic without  
1396 adhesives, coatings, paints, or finishes and test sample made from the plastic with  
1397 adhesives, coatings, paints, or finishes, as measured using ASTM D256 or ISO 180, or  
1398 the Charpy impact for the same test samples as measured using ISO 179; or

1399 ii. peer reviewed published literature concluding no significant impact.  
1400

1401 **References and details:** None

1402

1403

## 1404 5.4 Information and tools for reuse and recycling

1405

### 1406 5.4.1 Required - Information and reporting in preparation for reuse and recycling

1407 The manufacturer shall publish product information, consistent with Article 15 of the European  
1408 Union WEEE Directive 2012/19/EU for use by third-party reuse and recycling organizations, in a  
1409 language of the manufacturer’s choice. The information shall be made available to reuse and  
1410 recycling organizations upon request.

1411

1412 The manufacturer shall have a written procedure that requires the information to be available for a  
1413 minimum of 7 years following the end of production of the product.  
1414

1415 **Verification requirements:**

1416

1417 a) documentation that demonstrates that the information is available in all regions or

- 1418 countries in which the criterion is declared.  
1419  
1420 b) a written procedure that assures that the information is available for 7 years  
1421 following the end of production of the product.  
1422  
1423 c) demonstration that the information complies with requirements of Article 15 of the  
1424 European Union WEEE Directive 2012/19/EU.  
1425

1426 **References and details:** None  
1427

#### 1428 5.3.4 Optional – Further information and reporting in preparation for reuse and recycling

1429 The manufacturer shall make publicly available the additional information about preparation  
1430 for reuse and recycling listed in Table 5.4.2, including the same information as provided by the  
1431 manufacturer for use by its technicians for the same purposes.  
1432

1433 **Table 5.4.2**  
1434

Information made publicly available
<ul style="list-style-type: none"> <li>— information provided in conformance with criterion 5.4.1</li> <li>— disassembly information that includes, at a minimum, step-by-step disassembly instructions with required tools for field replaceable components and assemblies; and</li> <li>— description and manufacturer part numbers for field replaceable components and assemblies; and</li> <li>— product trouble shooting information as provided to manufacturers' authorized repair and refurbishment suppliers</li> </ul>

- 1435  
1436 The information shall be available in one or more of the following formats:  
1437 — online viewing on the web; or  
1438 — downloadable PDFs for offline viewing; or  
1439 — machine to machine file format: either HTML, XML or *IEEE 1874 – IEEE Standard for*  
1440 *Documentation Schema for Repair and Assembly of Electronic Devices.*  
1441

1442 The URL for the manufacturer's public website disclosing this information shall be provided  
1443 at the time of product registration, certification or self-declaration, and thereby made publicly  
1444 available. The manufacturer may exclude information for safety reasons and any information  
1445 that is confidential business information.  
1446

1447 **Point value:** 1  
1448

1449 **Verification requirements:**  
1450

- 1451 a) URL for public disclosure on manufacturer's website.  
1452  
1453 b) documentation that demonstrates that the information is available in all regions or countries  
1454 in which the criterion is declared.  
1455  
1456 c) demonstration that all of the required information is provided.  
1457  
1458 d) demonstration that the format meets the specified requirements.

1459

1460 **References and details:** None

1461

1462

1463 5.3.5 Optional – Product marked to identify components and materials requiring selective  
1464 treatment1465 The presence and location of all components and materials requiring selective treatment as identified  
1466 in the European WEEE Directive 2012/19/EU Annex VII shall be visually displayed on the product.

1467 The information shall be provided on a label or other permanent marking located on the product or

1468 visible upon removal of the external enclosure in order to clearly identify the presence before any

1469 treatment. Each component requiring selective treatment need not be labeled, but only a single label

1470 need be on the product.

1471

1472 The visual display shall either include the required information on the label or permanent marking,

1473 or shall link to the required information on a website that identifies the presence and location of the

1474 components and materials requiring selective treatment. The code shall be either a Quick Response

1475 (QR) code, or other code, at the choice of the manufacturer, that is in common use with available

1476 apps for utilization on mobile devices.

1477

1478 The label, or permanent marking, shall not interfere with the recyclability of the material on which it is

1479 affixed. If the label or marking is on a part made of plastic, that part with the label or marking shall

1480 meet the requirements of criterion 5.3.3, further design of plastics recycling.

1481

1482 For products that do not contain components requiring selective treatment, a label or other

1483 permanent marking shall be located on the product that indicates the absence of components

1484 requiring selective treatment and the product shall be awarded 1 point.

1485

1486 **Point value:** 1

1487

1488 **Verification requirements:**

1489

1490 a) visual documentation showing either a label or permanent marking that is a readable

1491 QR code, or other code, or that includes the required information on the label. A photo

1492 of the label satisfies this requirement.

1493

1494 b) if a code is used, demonstration that it links to the required information.

1495

1496 c) documentation of how the label or permanent marking is compatible with the

1497 recyclability of the material on which it is placed as required in criterion 5.3.3, further

1498 design for plastics recycling.

1499

1500 **References and details:** None

1501

1502

1503 5.3.6 Optional - Functionality testing software tools

1504 The manufacturer shall make publicly available and provide access to the necessary hardware

1505 functionality testing software tools and applicable updates that would be necessary to ensure

1506 the product meets operating specifications and can be returned to service. Hardware

1507 functionality testing software tools developed by a third party may be utilized to meet this

1508 requirement, provided the software tools are publicly available and the manufacturer provides  
1509 information on their accessibility and applicable updates.

1510

1511 Manufacturer shall also make available and provide access to:

- 1512 — any system or peripheral firmware (BIOS, etc.),
- 1513 — feature, functionality, maintenance and security updates, and
- 1514 — drivers for the network equipment.

1515

1516 Test software, updates, drivers and firmware do not have to support versions of the OS newer  
1517 than the last version officially supported by the manufacturer. Peripheral support only needs  
1518 to cover peripherals sold and supported by the manufacturer.

1519

1520 The manufacturer shall have a written commitment or policy that makes all of these items  
1521 available for a minimum of 5 years from the date of sale of the product and identifies if there  
1522 is a cost. The manufacturer shall declare if there will be any cost associated with the provision  
1523 of the functionality testing software tool.

1524

1525 The URL for the manufacturer's public website disclosing this information shall be provided  
1526 during product registration, certification or self-declaration, and made publicly available.

1527

1528 **Point value:** 1

1529

1530 **Verification requirements:**

1531

1532 a) public disclosure URL demonstrating that the required software tools are publicly available.

1533

1534 b) documentation of the required written commitment or policy, including identification if there  
1535 is a cost.

1536

1537 **References and details:** None

1538

1539

## 1540 5.5 Product longevity

1541

### 1542 5.5.1 Required – Product service and, or replacement components availability

1543 An option to purchase product service and, or replacement components through the  
1544 manufacturer or an authorized third party for at least two years for SNE and five years for LNE  
1545 from date of product sale shall be made available. This option may be available free of  
1546 charge or at separate charge.<sup>68</sup>

1547

1548 Manufacture shall demonstrate a commitment to replacement part availability for at least two years  
1549 for SNE and five years for LNE from the date of sale.

1550

1551 Replacement components shall include, at a minimum, if present in the product, power  
1552 supplies, fans or other mechanical cooling devices, hard drives, memory, processors (CPUs)  
1553 and printed circuit board assemblies.

1554

---

<sup>68</sup> Note that availability of a warranty or service agreement would meet this verification requirement if it includes the requirements of this criterion.

1555 The URL for the manufacturer’s public website disclosing this information shall be provided  
1556 during product registration, certification or self-declaration, and made publicly available.

1557

1558 For the purposes of this criterion, date of sale refers to the date of sale from the manufacturer  
1559 or their authorized reseller.

1560

1561 **Verification requirements:**

1562

1563 a) manufacturer’s website URL(s).

1564

1565 b) demonstration that the website contains information regarding:

1566 i. the availability of product service and, or product replacement components for at  
1567 least 2-years for SNE and 5-years for LNE after date of sale.

1568 ii. how to obtain product service and, or replacement components through the  
1569 manufacturer or an authorized third party.

1570

1571 c) demonstration of commitment may include:

1572 i. company policy on availability of service and, or replacement parts or

1573 ii. contract specifying availability of service and, or replacement part or

1574 iii. history of availability of service and, or replacement parts for similar products

1575

1576 **References and details:** None

1577

1578

### 1579 5.5.2 Required – Secure Data Deletion

1580 Manufacturer shall ensure that the user has access to functionality for the secure deletion of  
1581 customer data (including non-volatile memory) contained in the network device, without purchasing  
1582 separate software, for the purpose of reuse or recycling. Instructions on how to use this  
1583 functionality, the techniques used and the supported secure data deletion standard(s) must be  
1584 provided to the user. The functionality for data erasure must conform with the guidelines of NIST  
1585 800-88 Revision 1, at a minimum, for the level of “Clear”, or equivalent, in accordance with the  
1586 products storage technology.

1587 Functionality for secure data deletion can be implemented by means of technical solutions such as,  
1588 but not limited to:

1589 — a functionality implemented in firmware, typically in the Basic Input/Output System (BIOS);

1590 — a functionality implemented in the software included in a self-contained bootable

1591 environment such as a bootable CD-ROM; or

1592 — digital versatile disc (DVD) or universal serial bus (USB) memory storage device included with  
1593 the product, or in software installable in the supported operating systems provided with the  
1594 product.

1595 For SNE, the device shall provide a software function that resets the device so the device can be  
1596 reused or repurposed.

1597

1598 **Verification requirements:**

1599

1600 a) Specifications of the data erasure functionality provided with the product, including relevant  
1601 reference to compliance with a secure data deletion standard.



1602 Types of data include:

- 1603 i. Transactional data (e.g., session data)
- 1604 ii. Reporting data (consolidated data)
- 1605 iii. Non-volatile memory (routing table) (NVM) – write over with EPROM & base
- 1606 programming data; firmware data

1607

1608 **References and details:** None

1609

1610

## 1611 5.6 End-of-life management (corporate)

1612

### 1613 5.6.1 Required – Provision of product take-back service

1614 Manufacturers shall provide a country-wide or region-wide product take-back service for reuse,  
1615 refurbishment, and/or recycling for products declared and formerly declared to conform to this  
1616 Criteria Document, either directly, or through a contracted third party. The reuse, refurbishment,  
1617 and recycling programs should consider the hierarchy of management of used and end-of-life  
1618 electronic equipment and components disposal, which prioritizes reuse and refurbishment of  
1619 equipment and components, then materials recovery. If reuse and/or recovery are not possible,  
1620 energy recovery and/or disposal may be considered.

1621 The manufacturer shall take responsibility for the provision of the product take-back service.  
1622 Manufacturer shall inform customers in product promotional materials (e.g., web-based sales  
1623 information, product specifications) of the availability of the take-back service, and make available  
1624 information describing the product take-back service, including how to utilize the service, on the  
1625 manufacturer's public website. The URL for the manufacturer's public website describing the  
1626 product take-back service shall be provided during product registration, certification or self-  
1627 declaration, and made publicly available.

1628 Manufacturer shall make information available to the customer and final owner that identifies if  
1629 there are any direct costs associated with use of the product take-back service. This information may  
1630 be provided on the public website or upon request.

1631 In jurisdictions where there are existing laws and/or regulations which establish a program for the  
1632 collection and recycling of registered and formerly registered products, demonstration of  
1633 compliance with those legal requirements meets the requirements of this criterion.

1634 This criterion is applicable only in countries or regions for which the product is declared to conform  
1635 to this Criteria Document.

1636 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
1637 which the product is declared to conform to this Criteria Document. The approach used to conform  
1638 to this criterion may vary by country or region.

### 1639 **Verification requirements:**

- 1640 a) in jurisdictions within a country or region where the product is declared to conform to this
- 1641 Criteria Document and where there are existing laws and/or regulations which establish a
- 1642 program for the collection and recycling of registered products, the manufacturer shall
- 1643 demonstrate compliance to those laws and/or regulations.

1644

- 1645 b) in jurisdictions within a country or region where the product is declared to conform to this  
1646 Criteria Document and where there are no existing laws and/or regulations which establish a  
1647 program for the collection and recycling of products declared to conform to these criteria,  
1648 the following shall apply:
- 1649 i. demonstration that product take-back service is provided for products declared and  
1650 formerly declared to conform to this Criteria Document;
  - 1651 ii. URL for the manufacturer's public website that describes the product take-back service,  
1652 including how to utilize the service;
  - 1653 iii. evidence that customers are informed of the product take-back service in product  
1654 promotional materials, and
  - 1655 iv. demonstration that information is made available to customers and final owners  
1656 identifying if there are any direct costs associated with use of the product take-back  
1657 service. This information identifying if there are any direct costs can be available on the  
1658 public website, but is not required to be publicly available, provided it is available upon  
1659 request.

1660

1661 **References and details:** Manufacturer is not obligated to demonstrate utilization of product take-  
1662 back management services.

1663

#### 1664 5.6.2 Optional – Manufacturer take-back service for deinstalled network equipment

1665 Manufacturer shall offer, either directly or through a third-party, a country-wide or region-wide  
1666 take-back service to remove and process network equipment and components for which  
1667 conformance has not been declared and network equipment from other manufacturers that are  
1668 deinstalled at the customer site, for reuse and, or end-of-life management when new, equivalent  
1669 network equipment for which conformance has been declared are sold. Manufacturer shall offer the  
1670 take-back service option either directly or through its distribution channels to the first customer; the  
1671 customer may choose to utilize the take-back service option or not.

1672 Manufacturer shall inform customers in product promotional materials (e.g., web-based sales  
1673 information, product specifications) of the availability of the take-back service for deinstalled  
1674 network equipment, and make available information describing the product take-back service,  
1675 including how to utilize the service, on the manufacturer's public website.

1676 Manufacturer shall ensure that the network equipment recovered under this criterion are managed  
1677 in accordance with the management hierarchy and conformance evidence requirements of Sections  
1678 5.6.1 (Required-Provision of take-back service) and 5.6.3 (Required – End-of-life processing  
1679 requirements).

1680 This criterion is applicable only in countries or regions for which the product is declared to conform  
1681 to this Criteria Document.

1682 **Point value:** 2

1683 **Geographic applicability:** A manufacturer may declare this criterion differently in each country or  
1684 region for which the product is declared to conform to this Criteria Document.

1685 **Verification requirements:**

- 1686 a) evidence that customers are informed of the take-back service for deinstalled network  
1687 equipment in product promotional materials, and the URL for the manufacturer's public  
1688 website that describes the product tack-back service, including how to utilize the service.  
1689  
1690 b) evidence that network equipment recovered is managed in conformance with verification  
1691 requirements for Sections 5.6.1 (Required-Provision of take-back service) and 5.6.3  
1692 (Required-End-of-life processing requirements).  
1693

1694 **References and details:** None  
1695  
1696

### 1697 5.6.3 Required – End-of-life processing requirements

1698 The manufacturer shall demonstrate the following requirements are met for all end-of-life network  
1699 equipment collected by the manufacturer (or their contractual agent) pursuant to the “Required –  
1700 Provision of product take-back service” Section (5.6.1) contained herein, by utilizing:

- 1701 1) a government-approved program for end-of-life electronics processing, which includes  
1702 network equipment and in which the manufacturer does not control the selection of initial  
1703 service providers for network equipment in the jurisdiction where the network equipment  
1704 were taken back; or  
1705  
1706 2) initial service providers that meet one of the following:  
1707  
1708 a) are certified by a certification body to a Qualified Electronics Recycling Standard (as  
1709 specified below), such as:  
1710 — the Responsible Recycling (R2) Standard for Electronics Recyclers;  
1711 — the e-Stewards Standard for Responsible Recycling and Reuse of Electronic  
1712 Equipment; and  
1713 — EN 50625  
1714  
1715 Certification bodies shall be accredited by an IAF member accreditation body to certify  
1716 to the specific Qualified Electronics Recycling Standard identified; or  
1717  
1718 b) demonstrate legal compliance to a Qualified Electronics Recycling Standard, in countries  
1719 or regions that require compliance with a Qualified Electronics Recycling Standard; or  
1720  
1721 c) are certified to OHSAS 18001 and either ISO 14001 or EU EMAS<sup>69</sup> by a conformity  
1722 assessment body that is accredited by an IAF member accreditation body to certify to  
1723 the applicable management system Standards; and demonstrate conformance through  
1724 annual third-party audits to a Qualified Electronics Recycling Standard. The audit shall be  
1725 performed by a third-party conformity assessment body accredited by an IAF member  
1726 accreditation body to ISO/IEC 17021-1 or ISO 17065 and with competency to conduct an  
1727 audit to the Qualified Electronics Recycling Standard.  
1728

1729 For products declared in the US and Canada, manufacturers shall conform with a) or b), above.

---

<sup>69</sup> Certification to Recycling Industry Operating Standard™ (RIOS™) is equivalent; available at:  
<[www.rioscertification.org](http://www.rioscertification.org)>

1730 For either option a) or b) above, the manufacturer may use an initial service provider located in a  
1731 country other than where the end-of-life equipment is collected in compliance with national laws  
1732 implementing applicable international agreements.

1733 **Qualified Electronics Recycling Standard:** A Qualified Electronics Recycling Standard shall be publicly  
1734 available and meet minimum technical requirements a) through f) below. A certification body or a  
1735 registry service providing a registry of products declared to conform to this Criteria Document shall  
1736 determine whether an electronics recycling standard is qualified.

1737 The minimum technical requirements for a Qualified Electronics Recycling Standard are:

- 1738 a) the Standard is applicable within the country(s) / region(s) being declared to, and is  
1739 applicable to the scope of equipment covered by this criterion;  
1740  
1741 b) the Standard includes:  
1742  
1743 — a definition for “materials of concern” (or analogous term identifying materials with  
1744 hazardous characteristics as well as materials with special handling needs);  
1745  
1746 — requirements for handling and disposition of those materials to protect human health and  
1747 the environment; and  
1748  
1749 — a requirement that initial service providers have a written management plan that  
1750 addresses “materials of concern” and applicable legal requirements.  
1751  
1752 c) the Standard requires that initial service providers shall document, maintain, review  
1753 annually, and update as needed, an environmental, health and safety management system,  
1754 and train their workers regarding the implementation of this system;  
1755  
1756 d) the standard requires that material intended for reuse, repair, refurbishment, recycling and  
1757 disposal shall be managed in accordance with applicable trade and transporting laws of the  
1758 exporting, transit, and importing countries, as determined by the competent authority of the  
1759 countries involved;  
1760  
1761 e) the standard requires that initial service providers shall control, document and track the  
1762 material flow of all equipment, components, and materials covered by the standard, that  
1763 pass through its facilities or its control; and  
1764  
1765 f) the standard requires initial service providers to track all “materials of concern” to final  
1766 disposition, and to ensure that the downstream take-back service providers are meeting the  
1767 requirements of items b) through f).  
1768

1769 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
1770 which the product is declared to conform to this Criteria Document. The approach used to conform  
1771 to this criterion may vary by country or region.

1772 **Verification requirements:**

1773 For each of the country(s) / region(s) within which the manufacturer is declaring the product  
1774 conformant, the following shall be documented:

- 1775  
1776 a) government-approved program(s) utilized by the manufacturer in the jurisdiction where  
1777 the product was taken back with evidence that:  
1778 i. the scope of products covered by the government-approved program includes  
1779 network equipment covered under the scope of this Criteria Document;  
1780 ii. the government-approved program accepts network equipment from all  
1781 network equipment users, or the manufacturer offers take-back as per the  
1782 requirements of this criterion for network equipment products or users not  
1783 covered by the government-approved program, if permitted; and  
1784 iii. the manufacturer is participating in the government-approved program in that  
1785 country / region.  
1786  
1787 b) for each initial service provider that performs take-back services outside of a government-  
1788 approved program in the jurisdictions where the product was taken back, in conformance  
1789 with a Qualified Electronics Recycling Standard:  
1790  
1791 i. identification of the Qualified Electronics Recycling Standard(s) used;  
1792 ii. for initial service providers meeting the bullet above, copy / evidence of a  
1793 current certification, performed by a certification body that is accredited to  
1794 certify to the Qualified Electronics Recycling Standard (s); and/or  
1795 iii. for initial service providers meeting the bullet above, demonstration of legal  
1796 compliance to a Qualified Electronics Recycling Standard; and/or  
1797 iv. for initial service providers meeting the bullet above, documentation of the  
1798 accreditation and competency of third party conformity assessment body as  
1799 specified in the bullet above, and findings (including all nonconformances) in the  
1800 most recent third-party audit reports and other records confirming that all  
1801 nonconformances have been closed and that the initial service provider  
1802 conforms to the identified Qualified Electronics Recycling Standard  
1803  
1804 c) When an agent is being used, the manufacturer must demonstrate that it has a contract  
1805 with the agent and that the agent has a contract with the initial service providers that are  
1806 providing the take-back services for the manufacturer.  
1807

1808 **References and details:** None  
1809  
1810

#### 1811 5.6.4 Optional – Publicly available record of the reuse / recycling achievement

1812 Manufacturer shall make publicly available on their website the annual reuse, recycling, and  
1813 recovery achievements (as separate percentages of annual total weight returned as shown in Figure  
1814 1 of the take-back service for each country into which the product is declared to conform to this  
1815 Criteria Document. This criterion applies only to network equipment taken back under Section 5.6.1.  
1816 Network equipment recovered and processed under national or regional collection schemes  
1817 (mandated programs) may be included if the data is made available to the manufacturer. If data is  
1818 not available from a mandated program in which the manufacturer participates, and the  
1819 manufacturer fulfills Section 5.6.1 solely through mandated programs, the manufacturer may  
1820 declare “Not Applicable” to this criterion in the country or region.

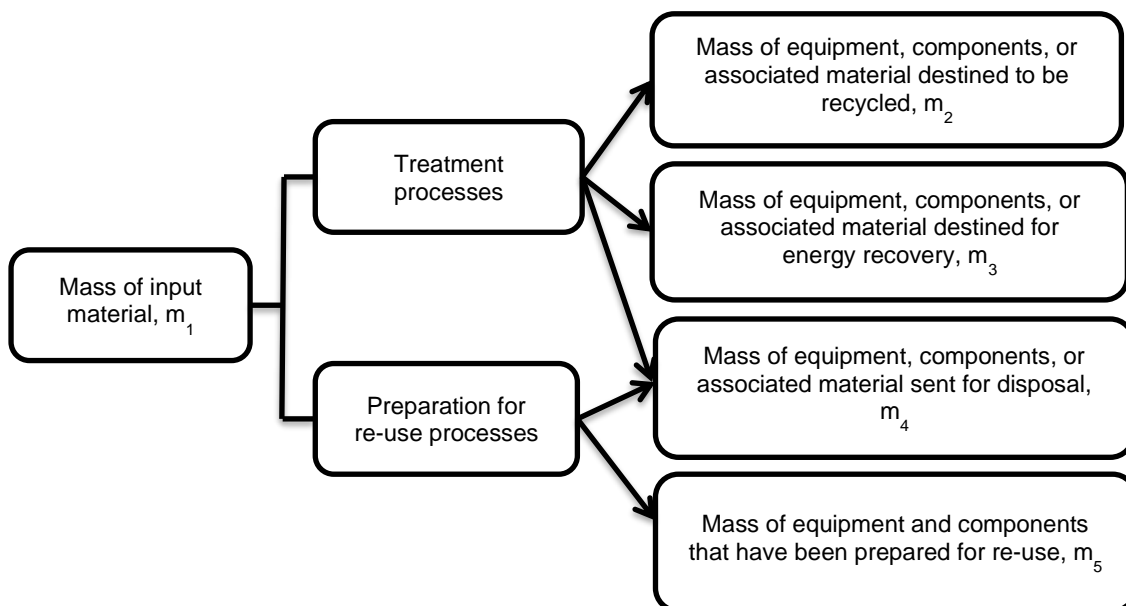
1821 With reference to Figure 1:

1822 Determination and calculation of the reuse, recycling, and recovery achievements at the reuse or  
 1823 treatment facility pursuant to Section 5.6.3, shall start with the receipt of the mass of all network  
 1824 equipment or network equipment components through the take-back service [m<sub>1</sub>] and end with:

- 1825 — [m<sub>5</sub>] mass of equipment or components prepared for reuse;
- 1826
- 1827 — [m<sub>2</sub>] mass of equipment, components, or associated materials intended for recycling that has  
 1828 been sent to the next treatment facility or final destination facility (e.g., smelter, extrusion plant,  
 1829 etc.);
- 1830
- 1831 — [m<sub>3</sub>] mass of equipment, components, or associated materials sent to a waste to energy  
 1832 facility; and
- 1833
- 1834 — [m<sub>4</sub>] mass of equipment, components, or associated materials sent to a thermal or landfill  
 1835 facility for disposal.
- 1836
- 1837
- 1838
- 1839
- 1840
- 1841

Figure 1

Flow chart showing separate parts of the reuse and treatment process



1842

1843 The total reuse achievement shall be calculated as:

1844 reuse achievement:  $\% \text{ rate} = \frac{m_5}{m_1}$

1845

1846 The total recycling achievement shall be calculated as:

1847 recycling achievement:  $\% \text{ rate} = \frac{m_2}{m_1}$

1848

1849 The total recovery achievement shall be calculated as:

1850 recovery achievement:  $\% \text{ rate} = \frac{m_2 + m_3}{m_1}$

1851 **Point value:** 2

1852 **Geographic applicability:** A manufacturer may declare this criterion differently in each country or  
1853 region for which the product is declared to conform to this Criteria Document.

1854

1855 **Verification requirements:**

1856 a) public URL for manufacturer's website with annual reuse, recycling, and recovery  
1857 achievements (as separate percentages of their annual total mass returned) of the take-back  
1858 service for each country or region into which the product is declared to conform to this  
1859 Criteria Document. At a minimum, the achievement must cover equipment collected under  
1860 Section 5.6.1, but can include other network equipment; and

1861

1862 b) statements of:

1863 i. reuse from the initial service provider or reuse operator (percentage by weight to  
1864 the mass of input equipment and, or components received for the preparation of  
1865 reuse);

1866 ii. recycling from the initial service provider or treatment operator (percentage by  
1867 weight to the mass of end-of-life equipment and, or components received); and

1868 iii. recovery from the initial service provider or treatment operator (percentage by  
1869 weight to the mass of end-of-life equipment and, or components received).

1870

1871 **References and details:** None

1872

1873

## 1874 6 Climate Change Mitigation

1875

### 1876 6.1 Internal power supply efficiency

1877

#### 1878 6.1.1 Required - Energy efficiency of internal power supplies

1879 Internal Power supply / supplies shipped with the product shall have been tested as in conformance  
1880 with the requirements of the 80 Plus<sup>®</sup> program as specified below in Table 6.1.1 below. If the  
1881 product does have an internal power supply or if the internal power supply is direct current (DC),  
1882 this is criterion is Not Applicable.

1883

**Table 6.1.1**

1884

Single Output

1885

Efficiency based on 80PLUS <sup>®</sup>	For Switches with PSUs Rated
80PLUS PLATINUM	≥1000W
80PLUS GOLD	≥ 500W and ≤1000W
80PLUS SILVER	<500 W

1887

1888

1889

1890

1891

Multi Output

Efficiency based on 80PLUS <sup>®</sup>	For Switches with PSUs Rated
---	------------------------------

1892

80PLUS GOLD	≥1000W
80PLUS SILVER	≥ 500W and <1000W
80PLUS BRONZE	<500 W

1893

1894

1895

1896

1897 **Verification requirements:**

1898

1899 a) bill of material, or other comparable documentation, identifying the tested power  
1900 supply is sold with the registered product.

1901

1902

1903

1904 **References and details:** Generalized Internal Power Supply Efficiency Test Protocol, Rev. 6.7.1,  
1905 available at

1906 [https://www.plugloadsolutions.com/docs/collatrl/print/Generalized\\_Internal\\_Power\\_Supply\\_Efficiency\\_Test\\_Protocol\\_R6.7.1.pdf](https://www.plugloadsolutions.com/docs/collatrl/print/Generalized_Internal_Power_Supply_Efficiency_Test_Protocol_R6.7.1.pdf)  
1907

1908

1909 **6.1.2 Optional - Energy efficiency of internal power supplies**

1910 Power supply / supplies shipped with the product shall have been tested as in conformance with the  
1911 requirements of the 80 Plus<sup>®</sup> program as specified below in Table 6.1.2 below. If the product does  
1912 have an internal power supply or if the internal power supply is direct current (DC), this is criterion is  
1913 Not Applicable.

1914

**Table 6.1.2**

1915

## Single Output

1916

1917

Efficiency based on 80PLUS <sup>®</sup>	For Switches with PSUs Rated
80PLUS TITANIUM	>1000 W
80PLUS PLATINUM	≥ 500W and ≤1000W
80PLUS GOLD	<500 W

1922

1923

## Multi Output

1924

1925

Efficiency based on 80PLUS <sup>®</sup>	For Switches with PSUs Rated
80PLUS PLATINUM	>1000 W
80PLUS GOLD	≥ 500W and ≤1000W
80PLUS SILVER	<500 W

1928

1929 **Point value: 1**

1930

1931 **Verification requirements:**

1932 a) bill of material, or other comparable documentation, identifying the tested power  
1933 supply is sold with the registered product.

1934

1935

1936

1937 **References and details:** Generalized Internal Power Supply Efficiency Test Protocol, Rev. 6.7.1,  
1938 available at



1939 [https://www.plugloadsolutions.com/docs/collatrl/print/Generalized\\_Internal\\_Power\\_Supply\\_Efficiency\\_Test\\_Protocol\\_R6.7.1.pdf](https://www.plugloadsolutions.com/docs/collatrl/print/Generalized_Internal_Power_Supply_Efficiency_Test_Protocol_R6.7.1.pdf)

1941

## 1942 6.2 External power supply efficiency

1943

### 1944 6.2.1 Required —Energy efficiency for external power supplies

1945 The external power supply shipped with the product shall have an efficiency at least meeting the  
1946 International Efficiency Marking Protocol for External Power Supplies Level VI average efficiency  
1947 levels, for the applicable external power supply product class.

1948 If the product does not ship with an external power supply or if the external power supply is direct  
1949 current (DC), this is criterion is Not Applicable.

#### 1950 **Verification requirements:**

1951 a) bill of material, or other comparable documentation, identifying the tested power  
1952 supply is sold with the registered product.

1953

1954 b) test report demonstrating efficiency level in which the product was tested at  
1955 voltage / frequency level appropriate within the countries the product will be sold.  
1956 It must be tested and shown conformant at 115 V/60 Hz or 230 V 50 Hz and / or  
1957 100V at 50 or 60Hz.

1958

1959 **References and details:** U.S. Department of Energy External Power Supplies Energy Conservation  
1960 Standard Final Rule, *Federal Register* 79 no. 27 (February 10, 2014).

### 1961 6.2.2 Optional—Energy efficiency for external power supplies

1962 The external power supply shipped with the product shall have an efficiency at least 1.0% higher  
1963 than the International Efficiency Marking Protocol for External Power Supplies Level VI average  
1964 efficiency levels, for the applicable external power supply product class. (*e.g. if the level VI minimum  
1965 average efficiency in active mode requirement is 88.0%, it would need a minimum average efficiency  
1966 in active mode of at least 89.0%*) If the product does not ship with an external power supply or if the  
1967 external power supply is direct current (DC), this is criterion is Not Applicable.

1968 **Point value:** 1

#### 1969 **Verification requirements:**

1970 a) bill of material, or other comparable documentation, identifying the tested power  
1971 supply is sold with the registered product.

1972

1973 b) test report demonstrating efficiency level in which the product was tested at  
1974 voltage / frequency level appropriate within the countries the product will be sold.  
1975 It must be tested and shown conformant at 115 V/60 Hz or 230 V 50 Hz and / or  
1976 100V at 50 or 60Hz.

1977

1978 **References and details:** U.S. DOE External Power Supplies Energy Conservation Standard Final Rule,  
1979 *Federal Register* 79 no. 27 (February 10, 2014).

1980

 1981 **6.3 Energy Efficiency of Small Network Equipment**

1982

 1983 **6.3.1 Required – Energy Efficiency of Small Network Equipment**

 1984 The product shall not exceed the electric power consumption limits for “Idle” and “On” states in the  
 1985 Broadband Equipment Code of Conduct applicable Tier for the year the product was first made  
 1986 available on the market.

 1987 **Verification requirements:**

- 1988 a) Documentation demonstrating the equipment and how it relates to the definitions in the
- 
- 1989 Code of Conduct on Energy Consumption of Broadband Equipment (e.g., number of ports
- 
- 1990 and functions).
- 
- 1991
- 
- 1992 b) Documentation demonstrating the year the product was first made available on the market.
- 
- 1993
- 
- 1994 c) Test report demonstrating measured power for idle and on state that are not more than 18
- 
- 1995 months old, issued by a laboratory that is:
- 
- 1996 i. accredited by one of ILAC MRA signatories according to ISO/IEC 17025 and
- 
- 1997 ii. holding accreditation scope that cover the standards relevant to the above
- 
- 1998 measurement requirement.
- 
- 1999

 2000 **References and details:** Code of Conduct on Energy Consumption of Broadband Equipment Version  
 2001 7.1 and Reporting sheet CoC BB equipment.  
 2002  
 2003

 2004 **6.3.2 Optional – Small Network Equipment load dependent power management**

 2005 The electrical power consumption during active operation must be both functionally and load  
 2006 dependent and have automatic power management to reduce electrical power consumption or  
 2007 allow the user to individually enable or disable non-required functions or select individual energy  
 2008 saving settings using a software function or a switch.  
 2009

2010

**Table 6.3.2**

Requirement	Limit
LAN	<ul style="list-style-type: none"> <li>The electric power consumption of unused LAN ports, i.e. ports with no cable connected as well as ports with a non- active device connected shall be minimized automatically.</li> </ul>
	<ul style="list-style-type: none"> <li>Router with Gigabit Ethernet ports shall detect connections to devices with Fast Ethernet ports and adapt the power consumption.</li> </ul>

2011

 2012 All copper-based physical network ports in product must support the Energy Efficiency Ethernet  
 2013 (EEE) defined by IEEE 802.3az.

 2014 **Point value: 1**

2015 **Verification Requirements:**

2016

- 2017 a) Documentation, such as specification, demonstrating that product meets the
- 
- 2018 relevant requirements.
- 
- 2019

 2020 **References and details:** IEEE 802.3az Energy Efficiency of Small Network Equipment

2021

 2022 **6.4 Energy efficiency of Large Network Equipment**

2023

 2024 **6.4.1 Required – Energy efficiency of large network equipment**

 2025 The product shall conform with the most current version of the ENERGY STAR for Large Network  
 2026 Equipment program, as per the requirements in Table 6.4.1 below.  
 2027

2028

**Table 6.4.1**

2029

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 Large Network Equipment Qualification Criteria  Or  — 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. ENERGY STAR Large Network Equipment Eligibility Criteria

2030

 2031 **Verification requirements:**

- 2032 a) identification of which of the above requirements in Table 6.4.1 to which the product
- 
- 2033 conforms.
- 
- 2034

- 2035 b) documentation demonstrating that product meets the relevant requirements in Table 6.4.1
- 
- 2036

2037

- 2038 c) for products that are not ENERGY STAR certified or listed on an international partner's
- 
- 2039 ENERGY STAR qualified product listing, test results from an ENERGY STAR accredited lab
- <sup>3</sup>
- 
- 2040 demonstrating that product conforms with the current version of the U.S. ENERGY STAR
- 
- 2041 Large Network Equipment Eligibility Criteria.
- 
- 2042

 2042 **References and details:** [ENERGY STAR® Large Network Equipment specification](#)

2043

## 2044 6.5 Supply chain energy efficiency

2045

## 2046 6.5.1 Optional – Energy efficient supply chains

2047 Manufacturer shall demonstrate that supplier facilities providing the design and, or manufacture of  
2048 one or more listed components or services meet one of the following:

2049 a) self-declaration of an energy management system that meets the requirements of ISO 50001,  
2050 or a nationally adopted version of the standard;

2051

2052 b) third-party certification to ISO 50001 or a nationally adopted version of ISO 50001. A supplier  
2053 manufacturing facility will be considered ISO 50001 certified if it is certified individually or if it  
2054 is within the scope of an enterprise ISO 50001 certification. Certification(s) shall be obtained  
2055 from a certification body accredited by an accreditation body that is a signatory to the  
2056 International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) with the  
2057 appropriate scope of accreditation.

2058

2059 c) Third-party certification to one of the following:

2060

2061 — the US DOE 50001 Superior Energy Performance™ (50001 SEP) program by an  
2062 ANAB-accredited SEP verification body(ies); or

2063 — Korea Superior Energy Management System (Superior EnMS) Program); or

2064 — a nationally equivalent program. An equivalent program shall meet the  
2065 requirements of the US DOE 50001 SEP program.

2066

2067 Where a corporate certification is achieved by a supplier in accordance with a multisite certification,  
2068 the certificate shall include all facilities claimed in the scope of facilities below.

2069 The scope of facilities for this criterion includes suppliers of the following nine component or service  
2070 categories for products within the scope of this Criteria Document:

2071 — printed circuit board;

2072 — printed circuit board assembly;

2073 — integrated circuit;

2074 — memory;

2075 — microprocessors;

2076 — battery;

2077 — power supply;

2078 — fans; and

2079 — final assembly.

2080

2081 Optional points shall be awarded based on the number of credits achieved through the suppliers'  
2082 facilities meeting a), b) or c) above. Supplier facilities receive credit as follows:

2083

2084 a) Facilities meeting part a) receive  $\frac{1}{2}$  credit

2085 b) Facilities meeting part b) receive 1 credit

2086 c) Facilities meeting part c) receive 2 credits

2087

2088 Optional points are awarded as follows:

2089

2090 — 1 optional point for 10 supplier facility credits; or

2091 — 2 optional points for 20 supplier facility credits.

2092

2093 The number of facilities for which credits may be claimed are limited to:

2094 — 2 suppliers per component or service category; or

2095 — 3 facilities per supplier.

2096

2097 **Point value:** 1 or 2

2098 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
2099 which the product is declared to conform to this Criteria Document. The approach used to conform  
2100 to this criterion may vary by country or region.

2101 **Verification requirements:**

2102 a) identification of the suppliers, components, and number of facilities or enterprises that meet  
2103 the requirements of Part a), b) or c);

2104

2105 b) for facilities claiming Part a), either copy of 50001 Ready program recognition certificate(s) at  
2106 the facility level, or all of the following:

2107 i. copy of the EnMS policy;

2108 ii. document demonstrating top management commitment to the EnMS;

2109 iii. description of context and scope of the EnMS;

2110 iv. energy review within the EnMS, scope and resulting significant energy uses, and at  
2111 least 24 months of energy consumption data prior to the time product declaration;

2112 v. list of energy objectives, energy performance indicators (EnPIs), energy baseline(s)  
2113 and action plans to achieve objectives;

2114 vi. demonstration of process to manage and implement annual internal ISO 50001  
2115 audits and summary of results of annual internal ISO 50001 audits;

2116 vii. documentation of annual management review and management decisions of  
2117 effectiveness and suitability of the EnMS; and

2118 viii. evidence of continual improvement of the organization's energy performance  
2119 through the results of the implemented action plans.

2120

2121 c) either one, or a combination of the following:

2122

2123 — for Part b), certificates, either at facility or enterprise level to ISO 50001 certification(s)  
2124 or to certification(s) to a nationally adopted version of the Standard for all facilities  
2125 claimed in scope. Certification(s) shall be obtained from a certification body accredited  
2126 by an accreditation body that is a signatory to the IAF MLA with the appropriate scope of  
2127 accreditation; And/or

2128

2129 — for Part c):

2130

2131 — documentation of current US DOE 50001 SEP program certification, or  
2132 certification(s) to a nationally equivalent 50001 SEP program; and

2133 — national program meets US DOE 50001 SEP program equivalency, if an equivalent  
2134 50001 SEP program is used.

2135

2136 **References and details:** None.

2137

2138 **6.6 Manufacturing chemicals**

2139

2140 **6.6.1 Optional – Mitigation and inventory of process fluorinated greenhouse gas emissions**  
 2141 **resulting from semiconductor manufacturing**

2142

2143 At least one supplier of central processing units (CPUs), dynamic random-access memory (DRAM),  
 2144 and or accelerators used in the product shall have:

2145 — developed a process F-GHG emissions inventory using one of the following methods:

2146 — the most recent IPCC Tier 2a, 2b, or Tier 3 methodology, or

2147 — methods included in the US EPA GHG Reporting Rule, Subpart I.

2148

2149 If the emissions inventory is not already publicly available, the supplier shall make the process  
 2150 F-GHG emissions inventory available to the manufacturer for the following categories of process  
 2151 F-GHGs: SF<sub>6</sub>, NF<sub>3</sub>, PFCs, and HFCs.

2152 — a GHG emissions reduction goal, or maintains year-to-year GHG emissions reduction activities,

2153 and publicly reports progress toward this goal or on emission reduction activities, on an annual

2154 basis. The reduction goal and activities may include other GHG emission sources, but shall at

2155 least include direct process F-GHG emissions from the semiconductor manufacturing process.

2156 Process F-GHG's are defined as SF<sub>6</sub>, NF<sub>3</sub>, PFCs and HFCs. Examples of F-GHGs include, but are not  
 2157 limited to, CF<sub>4</sub>, C<sub>2</sub>F<sub>6</sub>, C<sub>3</sub>F<sub>8</sub>, c-C<sub>4</sub>F<sub>8</sub>, C<sub>4</sub>F<sub>6</sub>, C<sub>4</sub>F<sub>8</sub>O, CHF<sub>3</sub>, CH<sub>2</sub>F<sub>2</sub>, CH<sub>3</sub>F, NF<sub>3</sub>, and SF<sub>6</sub>.

2158

2159 This criterion applies to fabrication facilities associated with products covered by the criteria  
 2160 document. It is acceptable if only a portion of the supplier fabrication facilities is associated with the  
 2161 products covered under this Criteria Document.

2162 Points shall be awarded according to Table 6.5.1.

**Table 6.5.1**

<b>GHG emissions activity</b>	<b>Total points</b>
F-GHG emissions inventory	1
F-GHG emissions inventory AND GHG emissions reduction goal or emission reduction activities	2

2163

2164 **Point value:** Maximum 2.

2165 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for

2166 which the product is declared to conform to this Criteria Document. The approach used to conform

2167 to this criterion may vary by country or region.

2168 **Verification requirements:**

2169 a) For F-GHG emissions inventory:

2170

2171 i. documentation of process F-GHG emissions inventory and reporting using one of  
 2172 the following:

- 2173 1. latest IPCC Tier 2a, 2b, or Tier 3 methodology, or  
2174 2. subpart I of the US EPA GHG Reporting Rule.  
2175  
2176 If the emissions inventory is not already publicly available, documentation that  
2177 the supplier has made the process F-GHG emissions inventory available to the  
2178 manufacturer for the following categories of process F-GHGs: SF6, NF3, PFCs, and  
2179 HFCs.  
2180  
2181 ii. unless specified already in the first verification above, reporting of:  
2182 1. specification of the method used in the first verification above to estimate  
2183 F-GHG emissions; and  
2184 2. specification of the method used to estimate DREs of abatement  
2185 equipment (e.g., facility-specific measurements or IPCC defaults).  
2186  
2187 b) For GHG emission reduction goal or emission reduction activities:  
2188  
2189 i. supplier documentation that states emissions reduction goal or emission  
2190 reduction activities and describes progress toward goal or progress made due  
2191 to emission reduction activities, made publicly available for example on a  
2192 website; and  
2193 ii. if not already included in the previous verification, supplier letter that  
2194 includes:  
2195 1. definition of baseline year for process F-GHG emissions reduction  
2196 goal or emission reduction activities; and  
2197 2. description of the method(s) implemented to reduce process F-GHG  
2198 emissions. This may include any one or a combination of, but not  
2199 limited to, the pollution prevention approaches outlined below, as  
2200 applicable:  
2201 a. process recipe optimization;  
2202 b. greenhouse gas replacement;  
2203 c. point of use (POU) abatement; and  
2204 d. remote plasma clean.  
2205

**References and details:**

2207 World Semiconductor Council Best Practice Guidance of PFC Emission Reduction, 2012.<sup>70</sup>

2208 Semiconductor Industry Association Post-2010 voluntary PFC emissions reduction goal.<sup>71</sup>

2209

## 2210 7 Corporate Environment, Social and Governance (ESG) 2211 Performance

2212

### 2213 7.1 Environmental management system (corporate)

2214

---

<sup>70</sup> World Semiconductor Council. <[www.semiconductorcouncil.org](http://www.semiconductorcouncil.org)>

<sup>71</sup> Semiconductor Industry Association. 1101 K Street NW, Suite 450, Washington, DC 20005.  
<[www.semiconductors.org](http://www.semiconductors.org)>

## 2215 7.1.1 Required – Environmental management system (EMS)

2216

2217 Manufacturer shall have formal, self-declared EMS for those parts of the company that have  
2218 significant responsibility for the design and manufacture of all products declared to conform to this  
2219 Criteria Document. The EMS shall meet the requirements of ISO 14001. Certification to either ISO  
2220 14001 or EMAS (European Union Eco-Management and Audit Scheme) meets this requirement.

2221

2222 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for which  
2223 the product is declared to conform to this Criteria Document. The approach used to conform to this  
2224 criterion may vary by country or region.

2225

2226 **Verification requirements:**

2227

2228 a) demonstration that the EMS meets the requirements of ISO 14001:

2229 i. copy of ISO 14001 certification(s), or copy of EMAS certification(s); and

2230 ii. for self-declared EMS, copy of EMS.

2231

2232 b) list of all design and manufacturing operations of the company with significant responsibility  
2233 for products declared to conform to this Criteria Document, or a signed statement from a  
2234 company official that the company does not perform ANY design and manufacturing in-  
2235 house; and

2236 c) demonstration that the EMS is applicable to those operations listed in the b).

2237

## 2238 7.1.2 Optional – Environmental management system (EMS) certification

2239 EMS specified in Section 7.1.1 shall be certified to either ISO 14001 or European Union EMAS by an  
2240 accredited third-party certification body. Certification bodies shall be accredited by an International  
2241 Accreditation Forum member accreditation body to certify to the specific Standard identified.

2242 Manufacturers who do not perform their own product design and who do not manufacture products  
2243 in their own facilities shall claim “Not Applicable.”

2244 **Point value:** 1

2245 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
2246 which the product is declared to conform to this Criteria Document. The approach used to conform  
2247 to this criterion may vary by country or region.

2248 **Verification requirements:**

2249 a) copy of ISO 14001 or European Union EMAS certificate or certificates covering company  
2250 design and manufacturing operations in b); and

2251

2252 b) list of all design and manufacturing operations of the company with significant responsibility  
2253 for products declared to conform to this Criteria Document.

2254

2255 **References and details:** None

2256



2257 7.2 Supply chain reporting

2258

2259 7.2.1 Optional – Environmental and social responsibility reporting on nine suppliers  
2260 (corporate)

2261

2262 Manufacturer shall publicly disclose corporate environmental and social responsibility performance  
2263 using the key performance indicators (or indicators) listed in Table 7.2.1.

2264

2265 The disclosure for this criterion shall include performance information for at least nine suppliers, and  
2266 shall include three of the manufacturer's top six suppliers (by annual spend, fiscal or calendar) of  
2267 each of the following three types of components, if applicable, for the product covered by this  
2268 Criteria Document:

2269 — processor(s) (CPU); and

2270 — printed circuit board(s).

2271

2272 The suppliers included in the disclosure may change from year to year. If there are less than three  
2273 suppliers for a component type named above, every supplier for that component type shall be  
2274 included in the public disclosure.

2275

2276 Manufacturer may publicly disclose key performance indicators by supplier or in aggregate. Supplier  
2277 names are not required in the public disclosure.

2278

2279 Reporting format and frequency:

2280

2281 — disclosures shall be publicly available on the manufacturer's website. It is acceptable to  
2282 provide a link on the manufacturer's website to the disclosure on the supplier's website;

2283

2284 — data shall be reported consistent with the Topic-specific Standards in the GRI Sustainability  
2285 Reporting Standards (GRI Standards) listed in Table 7.2.1. Manufacturers or suppliers may use a  
2286 reporting framework or program other than the GRI Standards (e.g., CDP, Electronic Industry  
2287 Citizenship Coalition [EICC] / Responsible Business Alliance [RBA], or Sustainability Accounting  
2288 Standards Board [SASB]) if it can be demonstrated how the required Topic-specific Standards in  
2289 Table 7.2.1 map to the alternative framework or program;

2290

2291 — publication of a full report or reports 'in accordance' with the GRI Standards is not required,  
2292 but would meet the requirements of this criterion if the report(s) covers the indicators specified  
2293 in this criterion; and

2294

2295 — performance against the indicators shall be reported and publicly disclosed at least annually.

2296

2297 Manufacturer may claim up to 2 points for this criterion. To claim 1 point, any six of the indicators  
2298 listed in Table 7.2.1 shall be publicly disclosed for all nine suppliers. To claim 2 points, ten of the  
2299 twelve GRI indicators listed in Table 7.2.1 shall be publicly disclosed for all nine suppliers.

2300

2301

2302

2303

2304  
2305

**Table 7.2.1**

Key performance indicators	Consistent with topic-specific GRI standard disclosure
energy consumption outside of the organization	302-2
energy intensity	302-3
reduction of energy consumption	302-4
direct GHG emissions (Scope 1)	305-1
energy indirect GHG emissions (Scope 2)	305-2
materials used by weight or volume	301-1
total water withdrawal by source	303-1
water recycled and reused; or water discharge by quality and destination	303-3; or 306-1
waste by type and disposal method	306-2
freedom of association and collective bargaining	407-1
operations with risk for forced or compulsory labor	409-1
operations with risk for incidents of child labor	408-1

 2306  
2307

**Point value:** Maximum 2

2308 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
2309 which the product is declared to conform to this Criteria Document. The approach used to conform  
2310 to this criterion may vary by country or region.

2311 **Verification requirements:**

- 2312 a) URL for public disclosure on manufacturer's website for the scope of suppliers covered by the  
2313 criterion;  
2314
- 2315 b) if the manufacturer has less than three suppliers for any of the three listed components, a  
2316 signed statement from manufacturer stating the number of suppliers of the component;  
2317
- 2318 c) if claiming 1 point, identification of which six indicators in Table 7.2.1 are addressed in the public  
2319 disclosure for each of the nine suppliers. If claiming 2 points, identification of which ten  
2320 indicators in Table 7.2.1 are addressed in the public disclosure for each of the nine suppliers;  
2321
- 2322 d) for each disclosure that uses a reporting framework or program other than GRI, demonstration  
2323 of how the key performance indicators map to the Topic-specific GRI Standard disclosures in  
2324 Table 7.2.1; and  
2325

2326 e) demonstration of at least one public disclosure for nine suppliers must be available at the time  
2327 of first declaration to the criterion, and annually thereafter.  
2328

2329 **References and details:** None  
2330

2331 **7.2.2 Optional – Environmental and social responsibility reporting on suppliers**

2332  
2333 Manufacturer shall publicly report on corporate environmental and social responsibility performance  
2334 that includes the key performance indicators listed in Table 7.2.2, and which use the reporting format  
2335 and frequency specified in Section 7.2.2.  
2336

2337 The disclosure for this criterion shall include all suppliers who directly contract with the manufacturer  
2338 and perform a manufacturing or assembly function for the manufacturer’s network equipment  
2339 products. Public disclosure of supplier names is not required.  
2340

2341 Public disclosure shall be made in accordance with Table 7.2.2.  
2342

**Table 7.2.2**

Consistent with topic-specific GRI Standards	Key performance indicators	Disclosure must include evaluation of supplier on these impacts:
414-1	new suppliers screened using social criteria	— disclosure must specify which social impacts were used for screening and evaluation for these indicators; and
414-2	negative social impacts in supply chain and actions taken	— labor practice criteria for screening and assessments must include compliance with laws on:  — minimum wages; — working hours; and — compensation for overtime.
308-1	new suppliers that were screened using environmental criteria	— disclosure must specify which environmental impacts were used for screening and evaluation for these indicators.
308-2	negative environmental impacts in the supply chain and actions taken	

2343  
2344 If a manufacturer does not contract for the manufacturing and assembly for the manufacturer’s  
2345 network equipment products, “Not Applicable” may be declared.

2346 **Point value:** 2

2347 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
2348 which the product is declared to conform to this Criteria Document. The approach used to conform  
2349 to this criterion may vary by country or region.

2350 **Verification requirements:**

2351 a) URL for public disclosure on manufacturer's website in accordance with the requirements of  
2352 the criterion;

2353

2354 b) list of suppliers who perform manufacturing or assembly functions for the product declared  
2355 to conform to this Criteria Document;

2356

2357 NOTE — This list is only provided for verification purposes and is not intended for public  
2358 disclosure. The manufacturer may choose to identify suppliers in generic terms (such as  
2359 Supplier A, B, C)

2360

2361 c) for each disclosure that uses a reporting framework or program other than GRI,  
2362 demonstration of how the key performance indicators map to Topic-specific GRI Standard  
2363 disclosures in Table 7.2.2; and

2364

2365 d) demonstration of at least one public disclosure for suppliers must be available at the time of  
2366 first declaration to the criterion, and annually thereafter.

2367

2368 **References and details:** None

2369

## 2370 7.3 Responsible mineral sourcing

2371

### 2372 7.3.1 Required – Public disclosure of use of conflict materials in products (corporate)

2373 Manufacturers shall:

2374

2375 — determine whether any of their products that they manufactured or contracted to have  
2376 manufactured contain conflict minerals that are necessary to the functionality or production of  
2377 those products and prepare disclosures on use and sources of these minerals in conformance with  
2378 Rule 13p-1 under the US Securities Exchange Act of 1934; and

2379

2380 — make such disclosures publicly available on their websites. The URL for the manufacturer's  
2381 public website disclosing this information shall be provided during product registration,  
2382 certification or self-declaration, and made publicly available.

2383

2384 These requirements apply to all manufacturers with products conforming to this Criteria Document,  
2385 regardless of whether they are Securities and Exchange Commission (SEC) registrants. Small  
2386 business, as defined below are exempt from this criterion.

2387

2388 In instances where the manufacturer is not required to be a registrant with the US SEC, all elements  
2389 of the disclosure under Rule 13p-1 are required, except the US administrative requirements (e.g., IRS  
2390 employer identification number).

2391

2392 For the purposes of this criterion, an "exempt small business" is a company that:

- 2393 — is not a subsidiary of or under common control with one or more other companies, and  
2394  
2395 — whose annual revenues are less than \$50 million USD in the most recent complete fiscal year  
2396 for which audited financial statements are available, provided that the period for such audited  
2397 financials concluded within the thirty-six months preceding product registration.  
2398

2399 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
2400 which the product is declared to conform to this Criteria Document. The approach used to conform  
2401 to this criterion may vary by country or region.

2402 **Verification requirements:**

- 2403 a) public disclosure on the company website of conflict minerals found in its products in  
2404 conformance with Rule 13p-1 under the US Securities Exchange Act of 1934.  
2405  
2406 b) URL of the conflict mineral public disclosure on the company website.  
2407  
2408 c) for exempt small businesses, a statement that the organization is not a subsidiary of nor under  
2409 common control of a larger company and a copy of its most recent (but not more than three years  
2410 old) audited financial statements, indicating that annual earnings were below \$50 million USD.  
2411

2412 **References and details:** None  
2413

2414 **7.3.2 Optional – Sourcing from validated conflict free smelters**

2415 Manufacturers shall conduct due diligence to determine all sources of conflict minerals used in the  
2416 covered products and demonstrate that they are from either:

- 2417 - recycled or scrap sources; or  
2418  
2419 - smelters and, or refiners that have been determined to be “conflict free”, consistent with  
2420 the definitions provided for in Rule 13p-1 under the US Securities Exchange Act of 1934.  
2421

2422 Due diligence shall conform to a nationally or internationally recognized due diligence framework,  
2423 such as the OECD *Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-*  
2424 *Affected and High-Risk Areas* (OECD Guidance). A brief description of the due diligence inquiry and  
2425 the determination shall be publicly disclosed.<sup>72</sup>  
2426

2427 If claiming “conflict-free”, independent private sector audit (IPSA) is required to verify  
2428 manufacturer’s control systems and justification for determination, conducted in accordance with  
2429 Rule 13p-1 under the US Securities Exchange Act of 1934.  
2430

2431 NOTE — For this criterion, “recycled or scrap sources” are defined as recycled metals that  
2432 are reclaimed from end-user or postconsumer products, or scrap processed metals created  
2433 during product manufacturing. Recycled metal includes excess, obsolete, defective, and  
2434 scrap metal materials which contain refined or processed metals that are appropriate to

---

<sup>72</sup> For example on a manufacturer’s website or SEC’s EDGAR (Electronic Data Gathering, Analysis, and Retrieval system), etc.

2435 recycle in the production of tin, tantalum, tungsten and, or gold. Minerals partially  
2436 processed, unprocessed or a bi-product from another ore are not recycled metals.<sup>73</sup>

2437

2438 **Point value:** 1

2439 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
2440 which the product is declared to conform to this Criteria Document. The approach used to conform  
2441 to this criterion may vary by country or region.

2442 **Verification requirements:**

2443 a) URL to a public website that contains a description of due diligence inquiry and determination.

2444

2445 b) if claiming “conflict free,” copy of the independent private sector audit report, as specified in  
2446 the criterion, verifying the manufacturer’s determination of conflict-free sourcing.

2447

2448 **References and details:** None

2449

### 2450 7.3.3 Optional – Participation in in-region conflict-free sourcing program

2451 Manufacturer shall participate in or source minerals from at least one of the in-region conflict free  
2452 controlled chain-of-custody sourcing programs which are validating and, or sourcing minerals from  
2453 certified conflict free sources in the Great Lakes region of Africa. In-region conflict free controlled  
2454 chain-of-custody sourcing programs shall also meet the following criteria:

2455 — multi-stakeholder participation (i.e., more than just one organization);

2456

2457 — is endorsed, recognized, funded, or contracted by the International Conference of the Great  
2458 Lakes Region (ICGLR), European Union, OECD, United Nations or US government agency /  
2459 stakeholder (USAID, state department);

2460

2461 — increases the supply of conflict-free minerals (3TG or other raw minerals) or reduces human  
2462 rights abuses associated with mineral extraction;

2463

2464 — has a system of oversight and public reporting; and

2465

2466 — does not allow donation, participation or activities by a manufacturer’s foundation to meet  
2467 requirements.

2468

2469 Examples of programs that meet this requirement include Responsible Artisanal Gold Solutions  
2470 Forum, International Tin Research Institute (ITRI), iTSCi (International Tin Supply Chain Initiative),  
2471 Better Sourcing Program (BSP), Partnership Africa Canada’s Just Gold Program, Diamond  
2472 Development Initiative, European Partnership for Responsible Minerals (EPRM) and Public Private  
2473 Alliance for Responsible Mineral Trade (PPA). “Participation in” may include, but is not limited to,  
2474 providing in-kind personnel services or other resources to an in-region conflict-free sourcing  
2475 program.

2476 **Point value:** 2

---

<sup>73</sup> OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High Risk Areas, p 12, FN 1, <https://www.oecd.org/daf/inv/mne/OECD-Due-Diligence-Guidance-Minerals-Edition3.pdf>

2477 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
2478 which the product is declared to conform to this Criteria Document. The approach used to conform  
2479 to this criterion may vary by country or region.

2480 **Verification requirements:**

- 2481 a) evidence of participation in at least one in-region conflict free sourcing program, as defined  
2482 above (e.g., manufacturer listed on program website, or confirmation from the program); or  
2483  
2484 b) documentation that the manufacturer sources conflict minerals for any of its products from  
2485 certified conflict free sources in the Great Lakes Region of Africa, including:  
2486  
2487 i. name of sourcing program and evidence of manufacturer sourcing from program;  
2488 ii. name of conflict mineral sourced from sourcing program and the minimum amount  
2489 sourced annually by the manufacturer; and  
2490 iii. component and product that the conflict-free mineral is used.  
2491

2492 **References and details:** None  
2493

2494 **7.4 Compliance with occupational health and safety and social responsibility**  
2495 **performance Standards**  
2496

2497 **7.4.1 Required – Manufacturer conformance with occupational health and safety**  
2498 **performance**

2499 Conformance to ISO 45001 *Occupational Health and Safety Management Systems*, ANSI/AIHA/ASSE  
2500 Z10, *Occupational Health and Safety Management Systems*, or OHSAS 18001 shall be maintained for  
2501 all manufacturer-owned operations with significant responsibility for the manufacture or assembly  
2502 of products declared to conform to this criterion document. The manufacturer shall incorporate  
2503 these Standards into the manufacturer's management system specified in Section 7.1.1  
2504 (environmental management system) or maintain separate conformance to one of these  
2505 occupational health and safety Standards.  
2506

2507 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
2508 which the product is declared to conform to this Criteria Document. The approach used to conform  
2509 to this criterion may vary by country or region.  
2510

2511 **Verification requirements:**  
2512

- 2513 a) list of all manufacturer-owned operations with significant responsibility for the manufacture  
2514 or assembly of products declared to conform to this Criteria Document OR a signed  
2515 statement from a company official that the company does not directly perform ANY  
2516 manufacturing or assembly of the products declared to conform to this Criteria Document;  
2517 and  
2518  
2519 b) for self-declared, a copy of management system documentation applicable to operations in  
2520 a) that demonstrate conformance with ISO 45001, ANSI/AIHA/ASSE Z10 or OHSAS 18001; or  
2521  
2522 c) for certified facilities, copy of certification or certifications to ISO 45001, ANSI/AIHA/ASSE  
2523 Z10 or OHSAS 18001 applicable to operations in a).

2524  
2525 7.4.2 Optional – Supply chain conformance to occupational health and safety performance  
2526 standards

2527 Manufacturer shall ensure that three of their top six suppliers (by annual spend, fiscal or calendar)  
2528 for each of these two main components, if applicable to the product declared to conform to this  
2529 Criteria Document, (processor[s] [CPU]; and printed circuit board[s]) produce these components in  
2530 supplier facilities that conform to or are certified to ISO 45001, ANSI/AIHA/ASSE Z10 or OHSAS 18001  
2531 if the facility is owned or operated by the supplier. Certification(s) shall be obtained from a  
2532 certification body accredited by an accreditation body that is a signatory to the International  
2533 Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) with the appropriate scope  
2534 of accreditation.

2535 If there are less than three suppliers for a component type named above, every supplier for that  
2536 component type needs to provide data.

2537 NOTE — For the purpose of this criterion “facility” is defined as a manufacturing site that is  
2538 majority owned or operated by one of the suppliers within the scope of this criterion.

2539 **Point value:** 2

2540 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
2541 which the product is declared to conform to this Criteria Document. The approach used to conform  
2542 to this criterion may vary by country or region.

2543 **Verification requirements:**

- 2544 a) either demonstration of conformance or copy of current certificate or URL verifying current  
2545 certification to ISO 45001, ANSI/AIHA/ASSE Z10 or OHSAS 18001 for facilities owned or  
2546 operated by three of their top six suppliers that produce the following two components, if  
2547 applicable, for the product declared to the Standard:  
2548 i. principle semiconductor device(s); and  
2549 ii. printed circuit board(s).
- 2550  
2551 b) if the manufacturer has fewer than three suppliers of components listed in a), a signed  
2552 statement from a company official stating the number of suppliers the company has for the  
2553 product declared to the criterion.

2554  
2555 **References and details:** None  
2556

2557

2558 7.4.3 Optional – Certification to social responsibility performance standard

2559 Manufacturer shall ensure that all supplier owned or operated facilities of three of its six top  
2560 suppliers (by annual spend, fiscal or calendar) that manufacture each of two main components  
2561 (processor[s] [CPU]; and printed circuit board[s]), if applicable, for the product are:

2562 — certified by accredited certification bodies to Social Accountability (SA) 8000. Certification  
2563 bodies shall be accredited by an authorized accreditation body to certify to the SA8000. The  
2564 certification shall be no older than three years (2 points).  
2565



2566 Optional points shall only be awarded for SA8000 certification if all facilities designated above are  
2567 certified to SA8000. If there are fewer than three suppliers for a component type named above,  
2568 every supplier for that component shall conform to this criterion; or

2569  
2570 — audited to the EICC/RBA Code of Conduct using the Validated Audit Process (VAP) (1 point).

2571  
2572 Optional point shall only be awarded for VAP audits if a certificate has been issued by the VAP  
2573 Operations Management Team to verify that for each facility:

2574 — initial validated audit reports contained no major or priority non-conformance findings. If  
2575 the facility was determined to be Low Risk<sup>74</sup> as defined by the EICC/RBA VAP, the initial report  
2576 shall be no older than four years. If the facility was determined to be Medium or High Risk<sup>75</sup>  
2577 as defined by the EICC/RBA VAP, the initial report shall be no older than two years; or

2578  
2579 — closure audit report confirms that all major and priority nonconformance corrective  
2580 actions resulting from previous VAP audits were remedied within time frame specified by the  
2581 EICC/RBA (i.e., RBA VAP Gold Recognition Certificate). The initial audit report shall be no older  
2582 than two years; or

2583  
2584 — closure audit report confirms that all non-conformance corrective actions resulting from  
2585 previous VAP audits were remedied within the time frame specified by the EICC/RBA  
2586 (i.e., RBA VAP Platinum Recognition Certificate). The initial audit report shall be no older than  
2587 four years.

2588  
2589 Optional point shall be awarded for EICC/RBA VAP audits if all facilities designated above  
2590 meet the VAP audit requirements or facilities meet a combination of VAP audits and SA8000  
2591 certification.

2592 If there are fewer than three suppliers for a component type named above, every supplier for  
2593 that component shall conform to this criterion.

2594 NOTE — For the purpose of this criterion “facility” is defined as a manufacturing site that is  
2595 majority owned or operated by one of the suppliers within the scope of this criterion.

2596 **Point value:** 1 or 2

2597 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
2598 which the product is declared to conform to this Criteria Document. The approach used to conform  
2599 to this criterion may vary by country or region.

2600 **Verification requirements:**

2601 a) demonstration of certification to SA8000 or EICC/RBA VAP audits for all supplier owned or  
2602 operated facilities of three of its six top suppliers that manufacture the three components listed  
2603 above, if applicable, for the product declared to conform to this criterion, including either:

2604

---

<sup>74</sup>

Currently defined by EICC/RBA as  $\geq 180$  of 200 points

<sup>75</sup> Currently defined by EICC/RBA as  $< 180$  of 200 points.

- 2605 i. certificate to SA8000 issued within three years prior to product declaration or product  
2606 verification for all supplier owned or operated facilities of three largest suppliers that  
2607 manufacture the three components; or  
2608
- 2609 ii. certificate issued by the EICC/RBA VAP Operations Management Team for all supplier  
2610 owned or operated facilities of three of its six top suppliers that manufacture the three  
2611 components listed above for the product declared to conform to this criterion. Initial  
2612 audit reports must be issued within the timeframes specified below and each certificate  
2613 must verify that:
- 2614 1. the initial validated audit report contained no major or priority non-  
2615 conformance findings. If the facility was determined to be Low Risk, the initial  
2616 report must be issued within four years of product declaration or product  
2617 verification. If the facility was determined to be Medium or High Risk, the initial  
2618 report must be issued within two years of product declaration or product  
2619 verification; or
  - 2620 2. the closure audit report confirms that all major and priority non-conformance  
2621 corrective actions were remedied within the time frame specified by the  
2622 EICC/RBA (i.e., RBA VAP Gold Recognition Certificate). The initial audit report  
2623 must be issued within two years of product declaration or product verification;  
2624 or
  - 2625 3. the closure audit report confirms that all nonconformance corrective actions  
2626 were remedied within the time frame specified by the EICC/RBA (i.e., RBA VAP  
2627 Platinum Recognition Certificate). The initial audit report must be issued within  
2628 four years of product declaration or product verification.  
2629
- 2630 b) if the manufacturer has fewer than three suppliers of components listed in a), a signed  
2631 statement from a company official stating the number of suppliers the company has for the  
2632 product declared to the criterion.  
2633

2634 **References and details:** None

## 2637 7.5 Product life cycle assessment

### 2639 7.5.1 Optional – Conduct life cycle assessment

2640  
2641 The manufacturer shall conduct a life cycle assessment (LCA) of the product declared to this Criteria  
2642 Document in accordance with ISO 14040/14044 or the *European Union Product Environmental*  
2643 *Footprint Guide*.

2644 The LCA shall include all stages (see Normative Annex 2) of the product life-cycle, from extraction of  
2645 raw materials through end-of-life (i.e., cradle-to-grave), and shall cover, at a minimum, the following  
2646 impact assessment categories using either US EPA TRACI 2.1, or University of Leiden CML 2001 (Nov  
2647 09), or European ILCD 2011, or Japan's LIME2 impact assessment methodologies:

- 2649 — global warming potential (GWP 100 years);
- 2650 — acidification potential (AP);
- 2651 — photochemical ozone creation potential (POCP, or “Smog”);
- 2652 — eutrophication potential (EP);
- 2653 — ozone depletion potential (ODP);

2654 — abiotic depletion potential (ADP) – or fossil fuels depletion when using TRACI.

2655

2656 To qualify under this criterion, the LCA must have been reviewed in accordance with ISO 14044  
2657 Section 6.1 by an independent third-party external to the manufacturer and must have been  
2658 conducted no more than three years prior to product registration or certification. The LCA may be  
2659 conducted on a family or class of products that includes the declared product.

2660 A new LCA will be required if:

2661 — the previously submitted LCA is more than five years old; or

2662

2663 — changes have been made to the product manufacturing or design and a sensitivity analysis  
2664 indicates that those changes have resulted in significant differences (a significant difference is  
2665 when there have been changes or updates in the product that resulted in a change in  
2666 environmental performance of the product entailing either an increase or decrease of 20% or  
2667 more on any one of the impact assessment categories listed above.

2668

2669 **Point value:** 3

2670 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
2671 which the product is declared to conform to this Criteria Document. The approach used to conform  
2672 to this criterion may vary by country or region.

2673

2674 **Verification requirements:**

2675 a) copy of LCA, URL to LCA, or URL to environmental product declaration (EPD) Type III label  
2676 applicable to the product declared to conform to the Standard.

2677

2678 b) documentation of independent third-party review of LCA in accordance with ISO 14044  
2679 Section 6.1.

2680

2681 **References and details:** None

2682

2683

#### 2684 7.5.2 Optional - Public disclosure of LCA results

2685 The LCA produced in Section 7.5.1 shall be made publicly available on the manufacturer's website  
2686 using one of the following documents:

2687 — third-party report of the LCA as defined in Section 5.2 of ISO 14044;

2688

2689 — environmental product declaration (EPD) Type III label in accordance with ISO 14025; or

2690

2691 — submitting the LCA or life-cycle inventory data for use in a national database (such as the US  
2692 LCI Database, the European LCA Platform Database, or the LCA Society of Japan Database, or other  
2693 public disclosure system.

2694

2695 This criterion may be satisfied by the manufacturer providing a link on its website to another publicly  
2696 available website. The URL for the manufacturer's public website disclosing this information shall be  
2697 provided during product registration, certification or self-declaration, and made publicly available.

2698

2699 **Point value:** 1

2700 **Geographic applicability:** This criterion shall be declared the same in all countries or regions and is  
2701 applicable only in countries or regions for which the product is declared to conform to this Criteria  
2702 Document.

2703 **Verification requirements:**

2704 a) URL to manufacturer's public website that contains either:

2705

2706 i. third-party report of LCA as defined in Section 5.2 of ISO 14044, or

2707 ii. environmental product declaration (EPD) Type III label in accordance with ISO  
2708 14025; or

2709

2710 b) documentation of LCA or inventory data submitted to a national database.

2711

2712 **References and details:** None

2713

2714

2715 **7.5.3 Optional – Environmental impact of product transportation (corporate)**

2716 Manufacturers shall annually conduct an assessment of greenhouse gas (GHG) emissions from supply  
2717 chain transportation activities for products declared to conform to this Criteria Document, from the  
2718 point of final product assembly to the customer, or transfer of product ownership.

2719

2720 The scope shall include transport for the applicable modes of freight movement for road, air, sea,  
2721 inland waterways, and rail, for products declared to conform to this Criteria Document. The  
2722 manufacturer may include additional products in the scope.

2723

2724 The manufacturer may choose to exclude from the assessment transportation segments where the  
2725 customer controls the decision on the carrier choice and/or mode of transportation.

2726

2727 The assessment of supply chain GHG emissions shall include well-to-wheel GHG emissions from all  
2728 modes of freight movement utilized (road, air, sea, inland waterways, and rail), and shall be performed  
2729 once per fiscal or calendar year using one or a combination of the following approaches:

2730

2731 — the Global Logistics Emissions Council (GLEC) Framework;

2732

2733 — the following mode-specific methodology as geographically applicable (if well-to-tank  
2734 emissions are not included in a mode-specific methodology they shall be included by means of a  
2735 scaling factor [such as that included in GLEC]):

2736

2737 — **road:** SmartWay or EN 16258;2738 — **air:** International Air Transportation Association (IATA) RP1678;2739 — **rail:** SmartWay or EcoTransIT;2740 — **sea:** Clean Cargo Working Group (CCWG) or International Maritime Organization (IMO);2741 — **inland waterways:** SmartWay or IMO.

2742

2743 — a methodology which includes a well-to-wheel performance-based assessment that uses  
2744 fuel-based or activity-based metrics for each applicable mode (e.g., weight and/or volume of

2745 freight moved, and/or distance by mode). Data used shall include fuel consumption and published  
2746 emission factors by fuel type.

2747

2748 A summary of results for absolute freight GHG emissions (e.g., annual tonnes of CO<sub>2</sub>e) and normalized  
2749 GHG emissions (e.g., grams of CO<sub>2</sub>e per tonne-km) for each mode (road, air, rail, inland waterways  
2750 and sea) shall be publicly disclosed and shall indicate what framework or mode-specific approaches  
2751 were used and where third-party verification applies.

2752

2753 Manufacturers shall also develop a transport supply chain greenhouse gas emission reduction goal  
2754 and publicly report progress towards meeting this goal annually.

2755

2756 **Point value:** 1

2757

2758 **Geographic applicability:** This criterion shall be declared the same in all countries or regions for  
2759 which the product is declared to conform to this Criteria Document. The approach used to conform  
2760 to this criterion may vary by country or region.

2761

2762 **Verification requirements:**

2763 a) demonstration of:

2764

2765 i. the location where the summary of results, the transport supply chain greenhouse  
2766 gas reduction emission goal and progress report towards the goal are publicly  
2767 posted  
2768 (e.g., manufacturer URL, Corporate Sustainability Report (CSR) report or program  
2769 URL); and

2770

2771 ii. if applicable, third-party verification in conformance with the applicable modes in  
2772 the GLEC Framework or other mode-specific approaches described above.  
2773 Document shall include credentials and contact information of third-party verifier.

2774

2775 **References and details:**

2776 Well-to-wheel emissions is an accounting of the life cycle GHG emissions from transportation of  
2777 products. Well-to-wheel analysis assesses the overall greenhouse gas impacts of a fuel, that include  
2778 each stage of its production and use. GLEC defines this as an “approach to estimate the impact of  
2779 the full fuel cycle including fuel production.”

2780 Well-to-tank emissions is an accounting of the GHG emissions from fuel production, including  
2781 extraction, cultivation, refining, transformation, transport and distribution of fuels. This is the first  
2782 stage of the life cycle GHG emissions, before the combustion “tank-to-wheel” or “operating phase.”  
2783 GLEC defines “well-to-tank” as “upstream phase of fuel production only.”

## Normative Annex 1

### Table of criteria and optional points

2784  
2785  
2786  
2787  
2788  
2789  
2790  
2791

All of the criteria in this table are applicable to both small network equipment (SNE) and large network equipment (LNE) unless otherwise noted. Criteria applicable only to LNE include 6.4.1 (required) and 5.2.3 (optional). Criteria applicable only to SNE include 6.3.1 (required) and 5.1.2, 5.2.4, 5.2.5, 6.3.2 (all optional).

Criterion #	Title	Max Optional Points
<b>4</b>	<b>Chemical Substances</b>	
<b>4.1</b>	<b>Reduction of substances of concern</b>	
4.1.1	<b>Required</b> - Conformance with provisions of European Union RoHS Directive	
4.1.2	<b>Required</b> - Conformance with substance restriction requirements of the European Union Battery Directive	
4.1.3	<b>Required</b> - Reduction of Bromine and Chlorine content of plastic parts > 25 grams	
4.1.4	Optional - Further reduction of Bromine and Chlorine content of plastic parts > 25 grams	2
4.1.5	<b>Required</b> - Conformance with supply chain communication provisions of European Union REACH Regulation	
4.1.6	Optional - Reduction of substances on the European Union REACH Regulation Annex XIV (authorization list)	1
<b>4.2</b>	<b>Inventory and assessment of substances</b>	
4.2.1	Optional – Record of declarable substances	1
4.2.2	Optional – Disclosure of declarable substances	1
4.2.3	Optional – Requesting full substance inventory	1
4.2.4	Optional – Acquiring substance inventory	2
4.2.5	Optional – Substance hazard assessment	2
4.2.6	Optional – Making safer substance use hazard assessment publicly available	1
<b>4.3</b>	<b>Reduction of substances of concern in packaging</b>	
4.3.1	<b>Required</b> – Elimination of added heavy metals in packaging	
4.3.2	<b>Required</b> – Restriction of use of elemental chlorine as a bleaching agent in paper-based packaging materials	
4.3.3	Optional – Restriction on the use of chlorine compounds in processing packaging materials	1
<b>5</b>	<b>Sustainable Use of Resources</b>	
<b>5.1</b>	<b>Product recycled content</b>	
5.1.1	<b>Required</b> – Declaration of postconsumer recycled plastic content	
5.1.2	Optional – Minimum postconsumer recycled content in external enclosures for SNE	1
5.1.3	Optional – Postconsumer recycled content of rare earth elements in hard drive(s) in product	2
<b>5.2</b>	<b>Resource efficiency of product packaging</b>	
5.2.1	<b>Required</b> – Enhancing recyclability of packaging materials	

5.2.2	<b>Required</b> – Recycled fiber in corrugated packaging	
5.2.3	Optional – Higher recycled fiber content in corrugated packaging for LNE	1
5.2.4	Optional – Bulk packaging for SNE	1
5.2.5	Optional – Recycled content of paper-based packaging for SNE	1
<b>5.3</b>	<b>Design for repair, reuse and recycling</b>	
5.3.1	<b>Required</b> – Design for repair, reuse and recycling	
5.3.2	<b>Required</b> – Design for plastics recycling	
5.3.3	Optional – Further design for plastics recycling	1
<b>5.4</b>	<b>Information and tools for reuse and recycling</b>	
5.4.1	<b>Required</b> – Information and reporting in preparation for reuse and recycling	
5.4.2	Optional – Further information and reporting in preparation for reuse and recycling	1
5.4.3	Optional – Product marked to identify components and materials requiring selective treatment	1
5.4.4	Optional – Functionality testing software tools	1
<b>5.5</b>	<b>Product longevity</b>	
5.5.1	<b>Required</b> – Product service and, or replacement components availability	
5.5.2	<b>Required</b> – Secure data deletion	
<b>5.6</b>	<b>End-of-life management (corporate)</b>	
5.6.1	<b>Required</b> – Provision of product take-back service	
5.6.2	Optional – Manufacturer take-back service for deinstalled servers	2
5.6.3	<b>Required</b> – End-of-life processing requirements	
5.6.4	Optional – Publicly available record of the reuse / recycling achievement	2
<b>6</b>	<b>Climate Change Mitigation</b>	
<b>6.1</b>	<b>Internal power supply efficiency</b>	
6.1.1	<b>Required</b> – Energy efficiency of internal power supplies	
6.1.2	Optional – Energy efficiency of internal power supplies	1
<b>6.2</b>	<b>External power supply efficiency</b>	
6.2.1	<b>Required</b> – Energy efficiency of external power supplies	
6.2.2	Optional – Energy efficiency of external power supplies	1
<b>6.3</b>	<b>Energy efficiency of small network equipment</b>	
6.3.1	<b>Required</b> – Energy efficiency of small network equipment	
6.3.2	Optional – Small network equipment load dependent power management	1
<b>6.4</b>	<b>Energy efficiency of large network equipment</b>	
6.4.1	<b>Required</b> – Energy efficiency of large network equipment	
<b>6.5</b>	<b>Supply chain energy efficiency (corporate)</b>	
6.5.1	Optional – Energy efficient supply chains	2
<b>6.6</b>	<b>Manufacturing chemicals (corporate)</b>	
6.6.1	Optional – Mitigation and inventory of process fluorinated greenhouse gas emissions resulting from semiconductor manufacturing	2
<b>7</b>	<b>Corporate Environment, Social and Governance (ESG) Performance</b>	
<b>7.1</b>	<b>Environmental management system</b>	
7.1.1	<b>Required</b> – Environmental management system (EMS)	
7.1.2	Optional – Environmental management system (EMS) certification	1
<b>7.2</b>	<b>Supply chain reporting</b>	

7.2.1	Optional – Environmental and social responsibility reporting on nine suppliers	2
7.2.2	Optional – Environmental and social responsibility reporting on suppliers	2
<b>7.3</b>	<b>Responsible mineral sourcing</b>	
7.3.1	<b>Required</b> – Public disclosure of use of conflict materials in products	
7.3.2	Optional – Sourcing from validated conflict free smelters	1
7.3.3	Optional – Participation in in-region conflict-free sourcing program	2
<b>7.4</b>	<b>Compliance with occupational health and safety and social responsibility performance standards</b>	
7.4.1	<b>Required</b> – Manufacturer conformance with occupational health and safety performance	
7.4.2	Optional – Supply chain conformance to occupational health and safety performance standards	2
7.4.3	Optional – Certification to social responsibility performance standard	2
<b>7.5</b>	<b>Product life-cycle assessment</b>	
7.5.1	Optional – Conduct life cycle assessment	3
7.5.2	Optional – Public disclosure of LCA results	1
7.5.3	Optional – Environmental Impact of Product Transportation	1

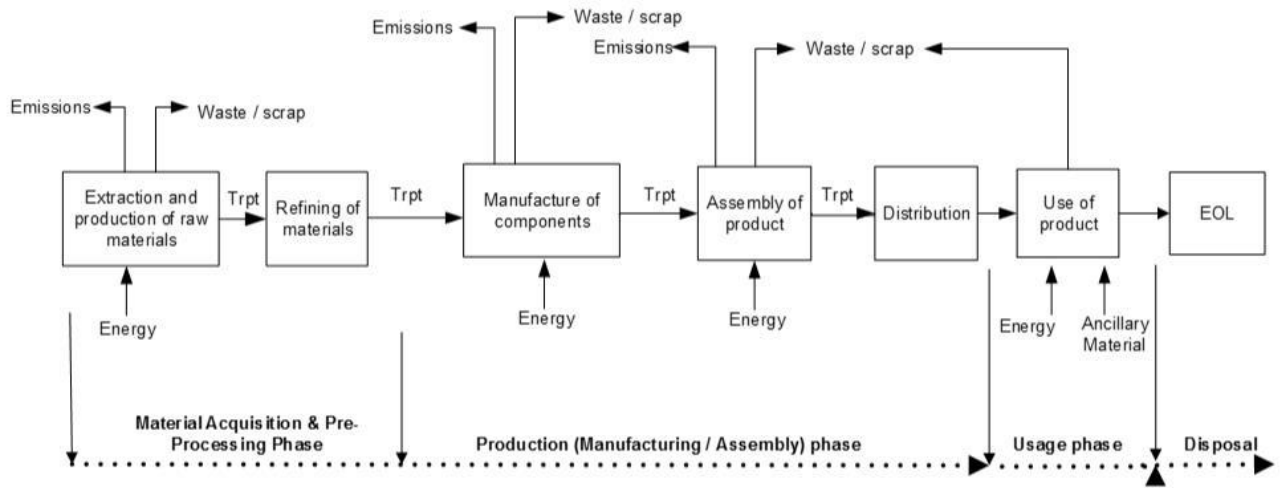
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Normative Annex 2

Figure 2. Life-cycle assessment example flow, section 7.5.1 system boundaries



Trpt = Transport

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## Informative Annex 1

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2801 While not explicitly cited in the criteria section of this document, the following references are  
2802 provided as non-normative useful guides for the application of this document.

2803

2804

2805 - DIN EN 15343: 2008-02, Plastics - Recycled Plastics - Plastics recycling traceability and  
2806 assessment of conformity and recycled content<sup>76</sup>

2807

2808 - European Chemicals Agency, *Guidance on requirements for substances in articles*<sup>77</sup>

2809

2810 - Solutions for Hope<sup>78</sup>

2811

2812 - Subsport Substitution Support Portal (SUBSPORT)<sup>79</sup>

2813

2814 - UL 746C, Standard for Polymeric Materials - Use in Electrical Equipment Evaluations<sup>80</sup>

2815 - US EPA *Protocol for Measuring Destruction or Removal Efficiency (DRE) of Fluorinated*  
2816 *Greenhouse Gas Abatement Equipment in Electronics Manufacturing* (US EPA DRE  
2817 Protocol)<sup>81</sup>

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<sup>76</sup> European Standards. Krimicka 134, 318 13 Pilsen, Czech Republic. <[www.en-standard.eu](http://www.en-standard.eu)>

<sup>77</sup> European Chemicals Agency. PO Box 400, 00121 Helsinki, Finland. <[www.echa.europa.eu](http://www.echa.europa.eu)>

<sup>78</sup> Resolve. 1255 23rd Street NW, Suite 275, Washington, DC 20037. [www.resolve.ngo/site-cfti](http://www.resolve.ngo/site-cfti)

<sup>79</sup> Substitution Support Portal. Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA), Fabricestraße 8, 01099 Dresden, Germany. <[www.subsportplus.eu](http://www.subsportplus.eu)>

<sup>80</sup> UL LLC. 33 Pflugsten Road, Northbrook, IL 60062. [www.ul.com](http://www.ul.com),  
<https://standardscatalog.ul.com/ProductDetail.aspx?productId=UL746c>

<sup>81</sup> US EPA, <https://www.epa.gov/f-gas-partnership-programs/epas-protocol-measuring-destruction-or-removal-efficiency>