Technology & Communications Sector Standards

RECORD OF PUBLIC COMMENT

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Introduction

The following table outlines all comments received during the 90-day public comment period for the draft Technology & Communications sector standards, which concluded on January 2, 2014. The table includes the name of the commenter, the relevant section of the exposure draft, the relevant comment excerpts, and how SASB addressed the comment. Please note that the "Relevant Section of Exposure Draft" refers to the sections in the draft Technology and Communications sector standards issued for public comment, which may be different from the sections presented in the final provisional standards issued on April 2, 2014.

Industry SICS No.	Name & Affiliation of Person providing Comment	Relevant Section of Exposure Draft	Comment Excerpts	SASB Response
TC0101 TC0102 TC0103 TC0201 TC0301 TC0401	Dunstan Allison-Hope Managing Director, Advisory Services BSR	All	BSR notes SASB's intention to identify sustainability topics at an industry level which may be material—depending on a company's specific operating context—to a company within that industry. We feel that the list of sustainability topics in the exposure draft generally pass the test of "may be material", though we note that a company's specific operating context will be critical to this determination and we expect many companies to reach a shorter list of material issues than the exposure draft.	Comment noted.
TC0102 TC0301 TC0401	Dunstan Allison-Hope Managing Director, Advisory Services BSR	Data Privacy & Freedom of Expression Data Security	There are a number of proposed Disclosure Topics and Accounting Metrics in the SASB Exposure Draft that we believe are increasingly material to the sector, but which are notably absent from other reporting guidelines and standards, such those provided by the GRI. These include Data Privacy and Freedom of Expression […] and Data Security […] We welcome the inclusion of these topics and metrics…, and emphasize the experimental and emerging nature of these metrics. However, we strongly urge SASB to proactively communicate with other organizations (such as the Global Network Initiative and the Berkman Center at Harvard) that are leading efforts to research the effectiveness of emerging company metrics on these issues and develop reporting protocols for companies to use […]	Comment noted. SASB standards are provisional for one year, and SASB upholds the general principle to assess the 'real world' application of standards, reviewing the effects of SASB standards and amending or replacing standards in a timely fashion, if warranted. SASB thanks BSR for the recommendation to engage with the Global Network Initiative and Berkman Center at Harvard.
TC0102 TC0301	Dunstan Allison-Hope Managing Director, Advisory Services BSR	Managing Systemic Risks from	There are some proposed Disclosure Topics / Accounting Metrics that seem only mildly related to sustainability issues and could usefully be removed from the standard. These especially include Managing	SASB recognizes that there are many definitions of sustainability, and we continue to focus our work on the definitions that we have included in our SASB Conceptual Framework. Disruptions to

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		Technology Disruptions	Systemic Risks from Technology Disruptions (TC0102-19, TC0102-20, TC0102-21, TC0301-13, TC0301-14, TC0301-15). Alternatively, the sustainability related aspects of these Disclosure Topics / Accounting Metrics (such as climate change and extreme weather events) could be more clearly called out.	critical infrastructure such as telecom services, or essential cloud-computing or other software and IT services provided to critical industries, can have social impacts, including endangering public safety or creating systemic disruptions. This may be the case irrespective of whether the disruption is due to extreme weather events, technical errors, or other business continuity risks.
TC0101 TC0102 TC0103 TC0201 TC0301 TC0401	Dunstan Allison-Hope Managing Director, Advisory Services BSR	All	First, there seems to be significant inconsistency between the Accounting Metrics contained in the Exposure Draft and commonly used Accounting Metrics found in other widely used reporting guidelines, especially the GRI. We believe this inconsistency will lead to increased implementation costs for business, frustration with unnecessarily duplicative reporting processes, and a significantly lower adoption of the standard.	SASB recognizes that various sustainability reporting programs have different goals. SASB is focused on the sustainability issues related to shareholder value and accounting metrics that are decision-useful to investors. Where possible, SASB seeks to harmonize with other reporting programs and uses accounting metrics requiring data already disclosed on company websites, sustainability reports, regulatory filings, or already collected by companies. Our first priority is to achieve a focused, simple disclosure around material sustainability issues, according to the criteria outlined in SASB's Conceptual Framework.
TC0102	Dunstan Allison-Hope Managing Director, Advisory Services BSR	Delivering Sustainability Solutions for Customers TC0102-18 TC0201-19 TC0301-12	Second, there are a number of Accounting Metrics that cover important and potentially very material sustainability issues, but which are far too detailed and specific in the way they are written. These Accounting Metrics seek to make precise issues that in reality are imprecise, and we believe this will significantly deter their uptake by companies. For example, in the Technology and Communications sector it is extremely difficult to draw clear boundaries around product and service categories, especially in the age of convergence. We recommend much looser Accounting Metrics for these issues, and greater experimentation over the next decade or so, with clearer definitions being adopted if evidence from company implementation supports that.	Comment addressed. In general, SASB has revised metrics to focus on quantitative disclosures where appropriate, with footnotes requiring context where needed. In cases where a quantitative metric was inappropriate, SASB has included discussion and analysis-based metrics. Furthermore, SASB will monitor the issue of Delivering Sustainability Solutions for Customers as an emerging issue, and is not including it in provisional standards, as evidence and stakeholder feedback indicates the issue does not meet the materiality threshold at present.
TC0102	Don M. Bain, P.E. GHG Management Institute	Environmental Footprint of Data Center and Office Hardware	1. GHG and waste reporting requirements are missing. 2. Energy reporting requirements and contain a number of errors with regard to Renewable Energy Certificates (RECs) 3. Too many reporting requirements have nothing to do with sustainability according to the SASB published definition of sustainability.	SASB has identified energy and water management as the focus of the environmental disclosure topics for the Software & IT Services, Internet Media & Services, and Telecommunications industries, along with GHG emissions in the Semiconductors industry, and water and waste management in manufacturing in the EMS & ODM and Semiconductors industries. We have revised the language in our energy metric around the consideration of

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			GHG emissions, water and waste are data fundamental to environmental reporting.	RECs. SASB recognizes that there are many definitions of sustainability, and we continue to focus our work on the definitions that we have included in our SASB Conceptual Framework.
			Renewable energy certificates or credits (RECs) are often misunderstood and the draft suggests gaps in understanding the definition of RECs and environmental consequences of purchasing RECs.	
			When I see the number of draft reporting requirements that have nothing to do with sustainability according to your definition, I predict this standard will fail. The preponderance of what the draft is requesting has no standing in relation to the reasons for soliciting this data. Further, this [draft] is burdensome and is justification for reasonable business people to choose not to participate in reporting	
TC0102	Don M. Bain, P.E. GHG Management Institute	Environmental Footprint of Data Center and Office Hardware TC0102-01	TC102-01 omits GHG reporting. The following should be added: "The registrant shall report the Scope 1 and Scope 2 GHG emissions associated with its data centers in accordance with the GHG Protocol Corporate Standard." Note that data centers employ refrigeration and fire suppression systems which contain HFCs and PFCs, and produce CO2e from fugitive emissions that may be substantial (given the high GWPs of these gases).	Comment noted. However, SASB has not come across data or research that shows that company value is materially affected by direct (Scope I) GHG emissions from the Software & IT Services industry. Materiality of energy and water consumption in data centers has been addressed through the energy and water metrics.
			The proposed standard omits any requirement to report waste. While the volume or mass of waste produced by data centers is not large relative to other facilities, the composition of the waste is material.	SASB has not come across evidence of materiality for waste from data centers. SASB welcomes additional evidence to support materiality. SASB will continue to review the effects of SASB standards and will amend or replace standards in a timely fashion, if warranted.
TC0102	Don M. Bain, P.E. GHG Management Institute	TC0102-01	TC102-01 line 01 does not specify a time period for the energy consumed. Use the same 12 month period as you do for TC102-02 line 01 for consistency	For the provisional standards, SASB has revised the language in the energy metrics relating to the consideration of what constitutes renewable energy for the purposes of this disclosure, the terminology used to describe energy consumption, consideration of RECs, and removal of the carbon-intensity aspect of disclosure. Additionally, given feedback from various parties, SASB has made reporting of the PUE metric optional in the provisional standards.
			TC102-01 line 02 seems without purpose and is ambiguous in its use of "overall energy consumption." What are you attempting to determine? Overall energy consumption includes fuels used for example in heating, on-site generation, etc. Are you asking for the energy consumption of the company, a single data center, a partial-use data center located in an office building, …? You need to tighten	

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			this up if you want to get any numbers for comparison, such as a reasonable investor might want.	As noted in the introduction to the provisional standards, the time period for reporting is always the registrant's fiscal year, unless otherwise stated.
			TC102-01 line 03 is ambiguous because it does not define "non-grid renewable energy consumption" and "overall energy consumption."	Finally, the discussion and analysis-based metric relating to future data center needs has been revised to focus on the integration of environmental considerations into planning processes and specifications.
			TC102-01 line 04 is flawed because it states "Non-grid renewable refers to the renewable energy the registrant … purchases through renewable energy certificates (RECs)…" A REC is not energy and to add or subtract it with any quantity of energy consumed is incorrect and misleading.	
			TC102-01 line 05 is flawed because it depends on definitions in TC102-01 line 06 that are ambiguous.	
			TC102-01 line 06 is clumsy in use of the phrases "GHG inventory of energy consumption" and "total GHG inventory of energy consumption." These phrases are not defined in any standards and lack an explicit definition of the boundary to be used in the calculation.	
			Before I go into attempting to repair this wording, I have to ask what are you attempting to accomplish with this metric? Investors invest in companies, not data centers.	
			If you feel there is merit in the GHG intensity of the energy consumed in the data center then the following wording should be inserted:	
			Given a boundary as defined in Figure 2 of the Green Grid White Paper #49-PUE: A Comprehensive Examination of the Metric found at http://www.thegreengrid.org/en/Global/Content/white-papers/WP49-PUEAComprehensiveExaminationoftheMetric calculate the total of Scope 1 direct GHG emissions and Scope 2 indirect GHG emissions and divide the total by the total energy consumed within the boundary during the same period. The GHG emissions calculated shall be in units of t CO_2e, shall include emissions of CO_2, CH_4, and N_2O, and shall be calculated in accordance with the World Resources Institute/World Business Council on Sustainable Development's (WRI/WBCSD) Greenhouse Gas Reporting Protocol-Corporate Standard, or equivalent.	

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			Note that data centers often contain refrigerant and fire suppression systems which leak, producing fugitive emissions of GHGs. These should be included in Scope 1.	
			TC102-01 line 07 is incorrect and misleading because it says "accounts for efforts to reduce energy-related emissions through … purchasing renewable energy through Renewable Energy Credits (RECs)…" As stated previously, purchasing a REC is not purchasing energy. Further, RECs do not reduce the emissions released to the atmosphere as a result of consuming power at data centers.	
			TC102-02 line 10: There are many sources of variability in addition to seasons. Remove the word "rolling" and replace with "weighted" to remain consistent with TC102-02-09. If you are requiring monthly reporting of the 12 month trailing weighted average, then say that. However, such a requirement is burdensome and should not be made.	
			TC0102-04 lines 17 and 18 address intent with regard to decisions or acts that have not happened and should be removed. If you mean to require respondents to have and disclose a policy for these future decisions or acts, then say that.	
TC0102	Don M. Bain, P.E. GHG Management Institute	Various	From http://www.sasb.org/sasb/vision-mission/, "SASB defines sustainability as environmental, social and governance factors that have the potential to affect long-term value creation and/or are in the public's interest." The following do not address issues related to SASB's definition of sustainability and should be removed from the proposed standard: TC0102-02, TC0102-05, TC0102-06, TC0102-07, TC0102-08, TC0102-09, TC0102-10, TC0102-11, TC0102-12, TC0102-13, TC0102-14, TC0102-15, TC0102-16, TC0102-17, TC0102-18, TC0102-19, TC0102-20, TC0102-21, TC0102-22; Lines 09 -- 12 inclusive; and Lines 20 – 83 inclusive.	SASB recognizes that there are many definitions of sustainability, and we continue to focus our work on the definitions that we have included in our SASB Conceptual Framework. The disclosure topics identified as likely to be material for Software & IT Services companies fall under one of SASB's five issue categories, outlined in the Conceptual Framework: Environment, Social Capital, Human Capital, Business Model and Innovation, and Leadership and Governance.

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TC0102	Don M. Bain, P.E. GHG Management Institute	Environmental Footprint of Data Center and Office Hardware	"Office Hardware" does not appear in the body of the document and should be removed from the title.	Comment addressed in SASB's provisional standards.
TC0101 TC0103	Tom C A Gosselin, Divisional Sustainability Manager, Region Americas, DNV GL Business Assurance Sustainability Services	Fair Labor Practices TC0101-04, TC0101-05 and TC0101-06	The industry description for Hardware states that this includes companies that "design, assemble, and manufacture computers, computer hardware, servers, and computer peripherals". It is not clear why this Standard should not include a Fair Labor Practices Disclosure Topic.	The provisional standards clarify that "For the purposes of this standard, it is assumed that Hardware companies outsource a significant proportion of product manufacturing activities, and therefore issues around water and waste management in manufacturing, which may be material for companies in the industry that have significant manufacturing operations, are not covered by this standard."

Additionally, SASB has published a Technical Bulletin, providing disclosure guidance for integrated Technology & Communications sector companies, including Hardware companies with in-house manufacturing operations. According to the disclosure guidance, such companies should provide disclosure on issues including waste and water management and fair labor practices, if these are material to company operations. |
| TC0101 TC0103 TC0201 | Tom C A Gosselin, Divisional Sustainability Manager, Region Americas, DNV GL Business Assurance Sustainability Services | Supply Chain Management and Materials Sourcing | [Suggested changes to metrics, with additions in blue] Propose to modify as follows: "Discuss the process for managing environmental and social risks within the supply chain including screening, codes of conduct, audits, assessments and/or certifications, corrective and remediation plans. Indicate if audits are first party, second party, or third party, the applicable standard and auditor qualification requirements." | In its provisional standards, SASB has refined the Supply Chain Management metrics to focus on critical materials and conflict minerals, and supplier audit compliance rates and corrective action rates. |
| TC0101 TC0103 TC0201 | Tom C A Gosselin, Divisional Sustainability Manager, Region Americas, DNV GL Business Assurance Sustainability Services | Supply Chain Management and Materials Sourcing | [Suggested changes to metrics, with additions in blue] Propose to modify as follows: "Number of sole-source Tier 1 suppliers, and percentage of critical supply base for which suppliers are sole-source. Percentage of Tier I suppliers who are EICC members and have implemented the EICC Code of Conduct. Percentage of Tier I suppliers in full compliance with the registrant's environmental and social/labor | For the provisional standards, SASB has refined the Supply Chain Management & Materials Sourcing metrics to focus on the sourcing of critical materials and conflict minerals, and supplier audit compliance rates and corrective action rates for the EICC Validated Audit Process (VAP) or an equivalent social and environmental responsibility code of conduct. |

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			requirements through own corporate code of conduct and other standards (may include ISO14001, OHSAS18001, SA8000, etc.)"	
TC0101 TC0103 TC0201	Tom C A Gosselin, Divisional Sustainability Manager, Region Americas, DNV GL Business Assurance Sustainability Services	Supply Chain Management and Materials Sourcing	[Suggested changes to metrics, with additions in blue] Propose to add: "Discuss the process for managing environmental and social risks within the supply chain including screening, codes of conduct, audits, assessments and/or certifications, corrective and remediation plans. Indicate if audits are first party, second party, or third party, the applicable standard and auditor qualification requirements.	SASB has refined the Supply Chain Management metrics to focus on the supplier audit compliance rates and corrective action rates, rather than a discussion and analysis of audit processes.
TC0101 TC0103 TC0201	Tom C A Gosselin, Divisional Sustainability Manager, Region Americas, DNV GL Business Assurance Sustainability Services	Cost Effectiveness	This is a difficult one to answer as it will be company-specific and commensurate to the company's ability to identify and measure the risk they are exposed, its risk tolerance and the return on investment, both financial and in protecting or enhancing intangibles. For some companies in the supply chain there will be clear customer-specific pressures, for others (and for specific indicators such as product environmental compliance) the cost will be the cost of doing business in certain markets. KPIS relating to the supply chain will be more labor intensive and any consequent reporting may be initially less reliable than indicators within the company's operational boundaries.	Comment addressed. SASB has refined supply chain reporting to focus on the aspects that are within the control or influence of a company, such as EICC VAP audit compliance rates and corrective actions.
TC0101	Bruce Klafter, Sr. Director, Corporate Social and Environmental Responsibility, Flextronics	Water and Waste Management TC0101-02-0.5	Water withdrawn from "freshwater" sources is unclear and should be clarified. Does this refer only to water directly withdrawn, e.g. via a well or pumped from a body of water or does it also include water purchased from a local water purveyor? If the latter is included, please define freshwater so that reporting entities do not need to undertake due diligence with each and every one of their purveyors.	Comment addressed. SASB has added a definition of freshwater in the provisional standards, and has indicated that water obtained from a utility can be assumed to be freshwater for the purposes of this disclosure.
TC0101	Bruce Klafter, Sr. Director, Corporate Social and Environmental	Water and Waste Management TC0101-03.11	Disclosing the average weighted cost of disposal for each type of waste and method of disposal will likely be difficult and costly to calculate and thus will be a barrier to reporting. In our case, we operate over 100 factories worldwide and a number of other facilities that generate more modest amounts of waste. Each of the factories has multiple waste streams and multiple disposal methods and	Comment addressed. SASB has removed the requirement to disclose the weighted average cost for waste management from the provisional standards.

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	Responsibility, Flextronics		vendors. Calculating the costs at one location is somewhat involved and attempting to do so for the entire company is impractical. We do not presently attempt to make this calculation and the business value (which is unclear) is outweighed by the burden. Lines .09 and .10 are probably the limit of disclosure for most companies.	
TC0101	Bruce Klafter, Sr. Director, Corporate Social and Environmental Responsibility, Flextronics	Product Lifecycle Management TC0101-10.39	I would anticipate some difficulty on the part of reporters in interpreting whether their standards "incorporate environmentally focused principles" and thus meet this criterion. EMS and ODM companies consider their design standards to be a mix of regulatory prescriptions, detailed customer specifications and internal company policies. It is unclear whether a product must simply "consider" the relevant principles or whether final designs must incorporate one or more environmentally superior features. In design for environment evaluations, there is also a question of benchmarks, i.e. is the design compared to a prior generation of the product (if one exists), to the "best" product on the marketplace (if that can be discerned) or to some other standard (e.g. EPEAT). In short, this is a highly complex and multifaceted topic and the proposed disclosure will lead to some confusion, may produce unnecessarily long or convoluted disclosures or may deter reporters altogether.	Comment addressed. In its provisional standards, SASB has refined the Product Lifecycle Management metrics to focus on the use of IEC 62474 declarable substances, the percentage of eligible products meeting EPEAT standards, and the recycling rates of end of life materials. The EPEAT metric includes a discussion and analysis-based footnote directing companies to provide a discussion of their approach to incorporating environmentally focused principles into product design.
TC0101	Bruce Klafter, Sr. Director, Corporate Social and Environmental Responsibility, Flextronics	Product Lifecycle Management TC0101-11.44	There is still a difference of opinion in industry in terms of the relative merits of e-Stewards and R2. This metric indicates a bias for e-Stewards without a stated justification; if this is the only "acceptable" standard that should be explained. The reality is that many partners, i.e. the disposal facilities, may have elected to use one or the other standard. Our operation in a particular location may only be able to partner with a R2 facility as opposed to e-Stewards. For disclosure purposes, companies should be able to state the percentage of material recycled through various types of facilities and indicate the standard to which they are certified.	Comment addressed. In its provisional standards, SASB has expanded the metric to explicitly encompass both e-Stewards and R2 standards, as well as other standards which a company may use. The disclosure now must identify the standards to which the recyclers are compliant.
TC0101	Bruce Klafter, Sr. Director, Corporate Social and Environmental	Supply Chain Management and Materials Sourcing	These proposed disclosures are not legitimately denominated as a "metric". Only line .50 even contemplates a metric. The bigger issue is that the disclosures contemplate an extraordinarily broad discussion of risk assessment and management. The proposal looks both unwieldy and in line .48 seems rather speculative. There is no distinction in this	Comment addressed. In its provisional standards, SASB has revised this metric to a discussion and analysis-based disclosure directing companies to provide a discussion of their approach to

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	Responsibility, Flextronics	TC0101-12.46-.50	metric between major and minor "constraints", "shortfalls" and "reductions in production capacity" and it seems to encourage disclosure of even nonmaterial information. The other factor left out of the metric is a company's recovery plan. Production can be pushed out or rescheduled, materials might be substituted, idled capacity can be reassigned to other products, etc. For the same reasons, it difficult to calculate a percentage of reduced production capacity as proposed in .50 I think it unlikely that many companies will elect to make this disclosure; the exception would be catastrophic events with obvious material impacts, e.g. the major floods in Thailand that disrupted disk drive manufacture and products incorporating such drives.	managing the risks associated with critical materials and conflict minerals.
TC0101	Bruce Klafter, Sr. Director, Corporate Social and Environmental Responsibility, Flextronics	Supply Chain Management and Materials Sourcing TC0101-13.51-.54	Reporters will consider the percentage of suppliers who are "sole source" or "critical" to be proprietary information. Moreover, there is no guidance as to how this percentage is calculated, i.e. out of the total number of suppliers, by overall spend, by spend per type of component, etc.	Comment addressed. SASB has removed this metric from the provisional standard. Instead, the Supply Chain Management & Materials Sourcing metrics for the EMS & ODM industry focus on critical materials and conflict minerals.
TC0101	Bruce Klafter, Sr. Director, Corporate Social and Environmental Responsibility, Flextronics	Supply Chain Management and Materials Sourcing TC0101-13.56	There is no indication of what is meant by "implementation" of the EICC code in the supply base. Does that refer to suppliers who have adopted the code or does it refer to some other measure of actual implementation. The former could be reported much more easily than the latter measure.	Comment addressed. SASB has removed this metric from the issue of Supply Chain Management & Materials Sourcing in the provisional standard. Instead, the Supply Chain Management & Materials Sourcing metrics for the EMS & ODM industry focus on critical materials and conflict minerals. Given the materiality of fair labor practices at the registrant's facilities, which can also be influenced by labor agencies contracted by the registrant, SASB has introduced a related metric under the issue of Fair Labor Practices for the EMS & ODM industry. The metric has been revised to focus on audit compliance rates and corrective action rates in accordance with the EICC Validated Audit Process (VAP) for the registrant and their suppliers.
TC0101 TC0103 TC0201	Barbara Kyle, National Coordinator, Electronics Takeback Coalition	Product Design & Lifecycle Management	[Suggested changes to metrics, with additions in blue] We are glad to see that the SASB draft standard clearly intends to address the important issue of hazardous materials in products, with	Comment addressed. In its provisional standards, SASB has refined the Product Lifecycle Management metrics to focus on the use of IEC 62474 declarable substances, the percentage of eligible products meeting EPEAT standards, and the recycling rates of end

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		TC0101-07 TC0103-08 TC0201-14 TC0101-08 TC0103-09 TC0201-15	the inclusion of two criteria under "Product Design and Lifecycle Management:" […] But these two criteria [European Union's RoHS Directive and REACH substances of very high concern and chemicals listed in Joint Industry Guide (JIG) 101 ed. 4.1., Table A. Declarable Substance List] are both too limited in scope to effectively address the problem. Most manufacturers are already meeting ROHS Directive, which addresses only six hazardous substances, with their global production. (So meeting this criterion is not an example of leadership in this industry.) The other two lists are also far too limited: The REACH candidate list of substances of very high concern is currently only 151 chemicals, only some of which are relevant for electronics. The CEA JIG list is no longer maintained as such (it's been incorporated into IEC Standard 62474) but it mostly represents the chemicals that are already being regulated. Both of these lists include hazardous materials that have been in use for a very long time, long enough for their hazardous properties to become known (via lab testing or exposure-related illnesses). So they are important to include. But these two measures alone fall far short of addressing the issue of hazardous chemicals in electronic products. A good example how why we must look beyond these lists is the emerging research showing that Indium is hazardous […] It's shocking that most electronics brand owners don't actually know all the chemicals in their products. This would not be tolerated in many other sectors. But that's the current state of this industry with very complex supply chains with thousands of suppliers. There are a few companies, like Seagate and Microsoft, who DO ask their suppliers to give them full chemical inventory on all their parts. Other brands are in the process of implementing this strategy. We recommend the addition of the following criterion: Percentage of products (by revenue) for which registrant has	of life materials. The EPEAT metric includes a discussion and analysis-based footnote directing companies to provide a discussion of their approach to incorporating environmentally focused principles into product design. Together, SASB considers that these metrics provide an indication of the material risks and opportunities related to hazardous materials and product lifecycle management.

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			a) Sought from all suppliers the full inventory of chemicals in the product	
			b) Obtained from all suppliers the full inventory of chemicals in the product	
TC0101 TC0103 TC0201	Barbara Kyle, National Coordinator, Electronics Takeback Coalition	Employee Health & Safety TC0201-12	[Suggested changes to metrics, with additions in blue] Don't limit [management approach to short-term and long-term health risks in TC0201-12] just to the semiconductor manufacturers. This is an issue for all electronics manufacturing. Therefore, it should be in all the standards related to manufacturing. Ask for more specifics about the exposure monitoring and human health monitoring being done for specific hazardous materials used in manufacturing. Because the chemical and material manufacturers don't do adequate hazard testing, manufacturers using those materials can't really know if they are safe or not […]Too often, companies don't start paying attention until many workers develop serious health problems and cancers. But often, warning signs existed much earlier […]we suggest adding the language (in blue) below: For exposure monitoring and for human health monitoring: How many chemicals are monitored? What percent of total chemicals used are monitored? What are the detection limits? How frequently are they monitored? How is health monitoring data reviewed and used to identify potential occupational illnesses?	SASB's evidence-based approach found that employee health and safety (H&S) is a material concern for companies with manufacturing operations in the Technology & Communications sector. We have included H&S metrics in the provisional standards for Semiconductors and EMS & ODM industries, which are characterized by significant manufacturing activities. For the Hardware industry, the provisional standards clarify that "For the purposes of this standard, it is assumed that Hardware companies outsource a significant proportion of product manufacturing activities, and therefore issues around water and waste management in manufacturing, which may be material for companies in the industry that have significant manufacturing operations, are not covered by this standard." Additionally, SASB has published a Technical Bulletin, providing disclosure guidance for integrated Technology & Communications sector companies, including Hardware companies with in-house manufacturing operations. According to the disclosure guidance, such companies should provide disclosure on issues such as Fair Labor Practices, which include H&S metrics, if these are material to company performance. Regarding the specificity of the metric relating to efforts to assess, monitor, and reduce exposure of employees to human health hazards, SASB has retained this metric in the form of a discussion and analysis-based disclosure. As outlined in the SASB Conceptual Framework, SASB standards are intended to provide decision-useful information to management and investors in a cost-effective manner.

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TC0101 TC0103 TC0201	Barbara Kyle, National Coordinator, Electronics Takeback Coalition	Water & Waste Management in Manufacturing TC0101-02 TC0103-02 TC0201-05	[Suggested changes to metrics, with additions in blue] We suggest the addition of the language in blue below. For the portion returned to the watershed, what percent has been treated adequately to meet drinking water standards? Just because water has been treated and returned to the watershed, it doesn't mean that it's clean. There are many polluting manufacturers whose treated water is still polluted. The point is whether they clean it up enough to drink it.	For the provisional standards, SASB has focused the water metric on the issue of water use efficiency and recycling rates, and water use in scarce regions. Pollution from manufacturing is covered by the separate metric of hazardous waste from manufacturing, and percentage recycled.
TC0201	Barbara Kyle, National Coordinator, Electronics Takeback Coalition	Water & Waste Management in Manufacturing TC0201-06	[Suggested changes to metrics, with additions in blue] Total ultrapure water (UPW) production and gallons produced per chip start. Investors will want to know not just total water used, but also how efficient the semiconductor manufacturing is in its water use. Therefore, the reporting should be related to chip manufacturing data.	For the provisional standards, SASB has removed the metric on ultrapure water production, instead focusing the water metric on the issue of overall water use efficiency and recycling rates, and water use in scarce regions. Water use efficiency can be derived by using the water consumption disclosure, normalized by the SASB Activity Metrics.
TC0101 TC0103 TC0201	Barbara Kyle, National Coordinator, Electronics Takeback Coalition	Water & Waste Management in Manufacturing TC0101-03 TC0103-03 TC0201-07	[Suggested changes to metric, with additions in blue and redactions] Amount of waste (tons) broken down by the following waste types: (1) Hazardous; (2) Non- hazardous; (3) Electronic waste (e-waste). For each waste type, indicate the percentage that is recycled, treated, incinerated, and landfilled, applied to land, emitted to air, discharged to water or placed in storage; and the weighted average cost ($) per ton for each disposal method. For volumes of hazardous waste that was were landfilled, indicate what percent of went to a special hazardous waste landfill, vs the percent that went to "regular" landfills. For hazardous waste applied to land, emitted to air, discharged to water, or placed in storage, describe treatments performed prior to final disposition. "Final disposition." We suggest striking out the word "treated" here. Ultimately, what's most useful is to understand the final disposition of waste: recycling, incineration, landfill, emission, storage. Treatment could occur before any of those steps, so it doesn't help clarify ultimate disposition and would only confuse the reporting. [...]For example, it's not useful to report a volume as "recycled" if you merely	For the provisional standards, SASB has revised the metric to focus on the amount of hazardous waste from manufacturing, and the percentage recycled. SASB has clarified what should be reported within the percentage recycled, which includes hazardous waste material that was reused, recycled or remanufactured (through treatment or processing) by the registrant and sent externally for further recycling. The standards provide further guidance on the definitions and scope of disclosure. As outlined in the SASB Conceptual Framework, SASB standards are intended to provide decision-useful information to management and investors in a cost-effective manner.

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			sold it to a recycler, when in fact the ultimate disposition might be that only a small percent of what the recycler received was recycled, and the rest was incinerated or landfilled. […] Treatment. We do think it's relevant to find out what kind of treatment is performed on hazardous waste prior to ultimate destination, so we've added "describe treatments performed prior to final disposition" above. It's important for investors to know whether the process is generating a kind of hazardous waste (including electronic waste) for which there is no adequate recycling or treatment infrastructure in that country/region.	
TC0101 TC0103 TC0201	Barbara Kyle, National Coordinator, Electronics Takeback Coalition	Water & Waste Management in Manufacturing TC0101-03 TC0103-03 TC0201-07	Other clarifications for the guidance document: This standard would benefit from some more specificity to make sure that companies are reporting similar information: The term "electronic waste" is defined to mean off-spec or otherwise substandard products or parts generated by the manufacturing process. Document should explain which definition of "hazardous waste" will be used here. They are not the same in each country. The US definitions are particularly weak and should not be the benchmark.	Comment noted. SASB defines hazardous waste according to Subtitle C of the U.S. Environmental Protection Agency's (EPA) Resource Conservation and Recovery Act (RCRA). SASB typically uses U.S. definitions and regulatory references and thresholds, as our focus is on disclosures made by companies to the U.S. Securities and Exchange Commission.
TC0101 TC0103 TC0201	Barbara Kyle, National Coordinator, Electronics Takeback Coalition	Water & Waste Management in Manufacturing TC0201-08	[Suggested changes to metrics, with additions in blue] Description of notices of violations, legal and regulatory fines and settlements […] This criteria should be included in all three standards (101 and 103 in addition to 201). There are <u>many</u> incidents of pollution from electronics manufacturing outside of the semiconductor industry. This should also include notices of violations even if fines were not imposed. Some countries will rarely impose fines even for serious violations. So it's important to capture information on the incidents, even if fines are not paid.	SASB has removed this metric from the provisional standard for the Semiconductors industry. SASB's metrics for Water & Waste Management in Manufacturing for the Semiconductors and EMS & ODM industries have been revised to focus on decision-useful and cost-effective information regarding the company's direct performance on the issue. See response above for how this applies to the Hardware industry.
TC0101 TC0103 TC0201	Barbara Kyle, National Coordinator, Electronics Takeback Coalition	Product Lifecycle Management	[Suggested changes to metric, with additions in blue and redactions] Amount (weight) of products recovered through take-back programs, broken down by the following return streams: • Asset recovery program	For the provisional standards, SASB has streamlined the product take-back metric to focus on a single percentage to reflect the rate of reuse and recycling (except in the Telecommunications industry standards, where SASB has retained the separation of reuse and recycling). This streamlined approach informs investors

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			• Public takeback and recycling programs • Lease returns • Trade in programs • Other Percentage of recovered products (by weight) that are (a) reused, (b) remanufactured, (c) recycled, and (d) landfilled. Percent of total classified as electronic waste (e-waste), percentage of e-waste and products going into reuse ~~recycled though~~ managed by entities certified to ~~with Basel e-Stewards certification~~ the e-Stewards Standard for Responsible Recycling and Reuse of Electronic Equipment, by independent certification bodies accredited by an International Accreditation Forum (IAF) member accreditation body to certify to that standard. 1. Why break down the take back volume? The term "Take-back programs" means different things to different companies. Some will include just their recycling programs, others will include their leased equipment returns (which we believe is not the intent of the question). 2. Certification. We applaud the reference to e-Stewards in this standard, as it is the highest standard in the recycling industry. Why all that extra language? What we want to see is an independent, 3rd party audit, performed by someone who actually knows how to audit to that standard. Notes for guidance document: • Figure for reuse should include the weight of the parts or whole products actually reused, not the full weight of a product from which only some parts are reused. (This is a common problem in reporting on reuse.) • ADD A DEFINITION. You need to define e-waste or you will get apples and oranges here. We suggest this definition: "E-waste means non-working or untested used products, parts, or materials derived from them, whether or not they have commodity value."	about improved resource efficiency, end-of-life waste minimization efforts, and capturing of value from such waste. As outlined in the SASB Conceptual Framework, SASB standards are intended to provide decision-useful information to management and investors in a cost-effective manner. SASB has provided additional clarification in the technical protocol regarding the returned products that should be included in the percentage recycled (e.g. not items returned for repairs), the accounting for portions of products that are actually reused or recycled, and the standards to which recyclers are certified.
All	Michael Leschke Green-e Energy Associate	Applicable to all SASB standards that reference renewable	In order for SASB's rules to encourage and facilitate use of renewable electricity, the guidance language should be clear throughout SASB standard accounting metrics that all renewable power purchase agreements (PPAs) should also explicitly include and convey	Comment addressed. For the provisional standards, SASB has revised the language in the energy metrics around the consideration of RECs.

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	Center for Resource Solutions	energy use by reporting entities	Renewable Energy Certificates (RECs) as part of those agreements. Likewise, RECs from any renewable electricity generated on-site must be retained and not sold in order for the registrant to accurately claim to be using the renewable electricity from that generator. We feel that this is in line with the intent of the draft language but that the language would be more easily understood and used with these clarifications. If RECs are not included as part of a PPA or on-site generation use, it allows for the possibility of multiple parties claiming the same environmental benefits of a unique MWh of renewable electricity generation, because the REC buyer would make the same claim that the purchaser of the electricity without the REC would attempt to make.	
All	Michael Leschke Green-e Energy Associate Center for Resource Solutions	Applicable to all SASB standards that reference renewable energy use by reporting entities	In addition to PPAs, standalone REC purchases, and on-site generation, renewable electricity can also often be bought through a voluntary renewable electricity option offered by an electric utility or other electric service provider. If Green-e Energy certified, these options offer renewable electricity that the customer would not have received through default electricity service. We read SASB's provision of not allowing disclosure of "the renewable portion of the energy drawn from electricity grids" (.04 in TC0101, TC0102, TC0103, TC0301 and TC0401, and .15 in TC0201) as a way to encourage registrants to proactively purchase renewable electricity beyond what they would get through their default electricity service.	Comment addressed. For the provisional standards, SASB has revised the language in the energy metrics around the consideration of what constitutes renewable energy for the purposes of this disclosure. This comment correctly notes that SASB excludes from the renewable energy disclosure the renewable portion of the electricity grid mix that is outside of the control or influence of the registrant.
All	Michael Leschke Green-e Energy Associate Center for Resource Solutions	Applicable to all SASB standards that reference renewable energy use by reporting entities	We suggest further clarification as to what is meant by the use of the term "renewable energy" in .04 in TC0101, TC0102, TC0103, TC0301 and TC0401, and .15 in TC020. If this term is meant to include both electricity and other forms of energy (such as thermal) we would encourage clarification as to what is included under the definition of "renewable energy". If only electricity is meant to be included here, we would recommend the term "renewable electricity" to be used throughout the section for clarity. Where RECs are mentioned, we encourage SASB to state that they are only to be associated with electricity. Along these lines, we recommend that all disclosures and accounting involving RECs should be applied prior to conversion from kilowatt-hours to gigajoules. This is because RECs are linked to electricity that	Comment addressed. For the provisional standards, SASB has revised the language in the energy metrics around the consideration of what constitutes renewable energy for the purposes of this disclosure. We retained the broader focus on energy, not just electricity, as we recognize there are tradeoffs when switching between various forms of energy consumption.

SASB has clarified that conversion factors must be used consistently for all data reported under this disclosure. |

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			is measured in MWh, and so the registrants' calculations will be simplified with this clarification.	
All	Michael Leschke Green-e Energy Associate Center for Resource Solutions	Applicable to all SASB standards that reference renewable energy use by reporting entities	The current guidance is not clear on how and whether to report electricity purchases that are not specifically from renewable sources. Most electricity purchased and used by companies adopting SASB's accounting standards will be the default electricity service provided by their electric utility. Such electricity is sourced from a variety of resource types, and will have emissions associated with its generation. Registrants should report such emissions resulting from the generation of the electricity they purchase that is not specifically renewable.	The focus of the energy metric is energy management. The metric does not require a company to report emissions associated with purchased energy consumption. Where companies in an industry depend on purchased energy for value creation, the impact on company value is through the reliability and price of energy supply, rather than directly from Scope 2 GHG emissions (e.g., regulatory risks related to GHG). In the provisional standards, SASB has revised the energy metric to provide clarity on renewable and non-renewable electricity sources.
All	Michael Leschke Green-e Energy Associate Center for Resource Solutions	Applicable to all SASB standards that reference renewable energy use by reporting entities	Regarding the use of "i.e." (that is) as opposed to "e.g." (for example) when stating that "RECs that are certified (i.e., through Green-e)", Green-e Energy is prominent in the US and Canada, but should only be a SASB requirement if registrants are based in these two countries. If SASB's intent is for its standards to be used outside of these countries, "e.g." may be more appropriate; however, under certain circumstances Green-e Energy certification may be possible outside of North America.	SASB has made the suggested change in the provisional standards.
All	Michael Leschke Green-e Energy Associate Center for Resource Solutions	Applicable to all SASB standards that reference renewable energy use by reporting entities	Taking all of these recommendations together, we suggest the following general language for any SASB standard that includes energy consumption, assuming that the original language is meant to apply only to electricity use: "The registrant shall disclose renewable electricity data for renewable electricity it directly produces on-site and consumes, or which it purchases through certified (i.e., through Green-e Energy) voluntary renewable electricity programs offered by electric service providers or utilities or through certified renewable energy certificates (RECs), or purchases through renewable power purchase agreements (PPAs). Registrant shall not disclose the renewable portion of the electricity purchased through its default electricity service." If electricity is included as only one type of "renewable energy" in this specific section, the term "electricity" in the above language could be changed to "energy" and the following	For the provisional standards, SASB has revised the language in the energy metrics around the consideration of RECs and other issues discussed above.

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			language can be added prior to the last sentence: "For all renewable energy consumed as electricity through any of the means listed above, RECs must be retired on behalf of all renewable electricity reporting by registrant."	
All	Michael Leschke Green-e Energy Associate Center for Resource Solutions	Applicable to all SASB standards that reference renewable energy use by reporting entities	Finally, CRS supports the inclusion of emissions from purchased electricity use (scope 2 emissions) to the proposed disclosure for the Environmental Footprint of Data Center and Office Hardware (TC0401), and would also support inclusion of scope 2 emissions reporting to the proposed disclosure guidance in all applicable SASB standards. It is possible to achieve zero emissions from electricity use in most cases by consuming 100% renewable electricity; however, we acknowledge that some fuel sources commonly considered renewable (e.g. biomass) may not be recognized as zero emissions fuel sources by all reporting guidelines and standards.	The focus of the energy metric is energy management. The metric does not require a company to report emissions associated with purchased energy consumption. Where companies in an industry depend on purchased energy for value creation, the impact on company value is through the reliability and price of energy supply, and sometimes from reputational risks related to GHG emissions, rather than directly from Scope 2 GHG emissions (e.g., regulatory risks related to GHG). In industries where Scope I emissions are significant (either in terms of magnitude or potency), leading to direct regulatory risks with impact on company value, SASB requires metrics on Scope I GHG emissions.
TC0102	Nicola Peill-Moelster, PhD, Director of Environmental Sustainability, Akamai Technologies	Environmental Footprint of Data Center and Office Hardware	I found this section confusing as to what electricity and GHG are being covered. Is it the entire company's electricity generating Scope 1 and 2 GHG? Because outsourcing of IT and data center operations has become strategic for economic and flexibility reasons it's important to have companies account for these outsourced operations where possible. These operations would include both internal and operations that support service delivery (revenue generation).	In its provisional standards, SASB has revised the scope of the energy metric to encompass only energy consumed by entities owned or controlled by the organization. See comments above regarding reporting of energy consumption versus Scope I GHG emissions. The intent is for the energy metric to capture the risks to company value related to energy supply and price volatility. In the provisional standards, reputational risks associated with use of fossil fuel-based energy to power data centers are captured through the metric requiring disclosure on percentage renewable energy, and a discussion and analysis-based disclosure: "Description of the integration of environmental considerations to strategic planning for data center needs." SASB has further introduced Activity Metrics to allow for normalization of all sustainability accounting metrics across a number of aspects that will characterize the disclosures. This includes the amount of data processing and data storage capacity, including the amount outsourced or co-located.
TC0102	Nicola Peill-Moelster, PhD, Director of	Environmental Footprint of	This section is ambiguous with respect to companies that outsource their data center and IT infrastructure (colocation, hosting, Cloud);	In its provisional standards, SASB has revised the scope of the energy metric to encompass only energy consumed by entities

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	Environmental Sustainability, Akamai Technologies	Data Center and Office Hardware TC0102-01	have a split of insourcing and outsourcing; have a mix of data center infrastructure used for internal purposes and to provide service - 0.01, 0.02, 0.05. For example, does TC0102-01.01 include all company operations (office + data centers), just data center? How is office hardware defined? If a reporting company collocates its IT equipment its electricity consumption is via the third-party colocation vendor. Should this company report zero for its electricity consumption, only the electricity consumed by its IT equipment, or the electricity consumed by its IT equipment + fraction of data center infrastructure that supports its IT equipment, e.g., cooling equipment? I recommend explicitly defining what is meant by "data centers". Does this include the IT equipment?	owned or controlled by the organization. This disclosure includes all energy consumed by such entities, irrespective of whether it is used for owned data centers or other IT equipment. SASB has further introduced Activity Metrics to allow for normalization of all sustainability accounting metrics across a number of aspects that will characterize the disclosures. This includes the amount of data processing capacity and data storage capacity, including the amount outsourced or co-located.
TC0102	Nicola Peill-Moelster, PhD, Director of Environmental Sustainability, Akamai Technologies	Environmental Footprint of Data Center and Office Hardware TC0102-04	It is unclear if "determining the location of new data centers" applies also to outsourced data center services, such as, "collocation" and "hosting". If so, recommend adding language to make this clear these use cases are included. If not, consider a clause distinguishing these data center use cases.	In its provisional standards, SASB has refined this metric to focus on the registrant's strategic planning for data center needs, including owned and outsourced operations.
TC0102	Nicola Peill-Moelster, PhD, Director of Environmental Sustainability, Akamai Technologies	Recruiting and Managing a Global Skilled Workforce TC0102-13	This item seems to suggest by exclusion that onshore activities and infrastructure are not at risk. Given the level of sophistication of security breaches to onshore systems by offshore entities I'm not sure I understand the point of distinguishing. If offshoring is considered more vulnerable I would also recommend distinguishing between safe countries, e.g., in Europe, versus more vulnerable countries such as Nigeria, China.	SASB has removed this metric from the provisional standard, to focus on metrics associated directly with employee management.
TC0102 TC0401	Mark Schiller Executive Director, The Green Grid	Environmental Footprint of Data Center and Office Hardware TC0102-02 and TC0401-02	PUE is best used as a tool to measure improvement in a specific data center over time. It is appropriate to discuss where and how it is implemented within an organization, but TGG has, for many years, discouraged the use of PUE as a comparison between different data centers. There are many factors that can affect PUE and not all of these are under a given's organization's or facility's control. Using PUE as a blanket metric to assess 'aggregate goodness' across multiple facilities will result in some organizations being inappropriately labeled as	Given feedback from various parties, SASB has made reporting of the PUE metric optional in the provisional standards. The revised required metrics for the environmental footprint issue are intended to capture risks related to energy supply reliability and prices and reputational risks from use of fossil fuel-based energy. This takes into account various strategies that can be implemented to reduce overall energy consumption. SASB's research and stakeholder feedback shows that the environmental footprint of hardware infrastructure is likely to be

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			superior, while others, which may actually be run in a more responsible manner, are labeled as inferior.

All this being said, The Green Grid does believe that an organization that does not measure its impact, cannot manage its impact. The commitment to measure and manage accurately and on a regular basis is the best indicator of an organization's commitment to data center energy efficiency, more so than its actual performance numbers.

As a result, we would caution the SASB to reconsider their basic approach to this question.

If SASB decides to retain the notion of a "weighted average PUE", we are concerned that the term "weighted average" PUE would be confusing to implementers, and should be more precisely named and specified as "Enterprise-wide PUE". Further we ask that the calculation method for "Enterprise-wide" PUE be specified as noted below, in our suggestions for alternative language for the current sections […]

In addition, we further caution SASB to ensure that these types of questions are addressed in the correct standards. It is very possible today that an Internet Media and Services company has outsourced most of its IT, leaving it with only marginal IT environmental footprint. On the other hand, a neighboring financial institution may be managing all of its IT in-house, with a substantially larger footprint both in terms of units of equipment and overall resource consumption. | material for the Software & IT Services and Internet Media & Services industries.

Leading publicly-listed companies in these industries, accounting for a significant proportion of industry revenues, own several large data centers and software development labs globally and offer cloud-based services to customers. Public cloud-computing is expected to expand further.

SASB will continue to evaluate the materiality of energy and water consumption for industries in other sectors using its evidence-based approach. |
| TC0101 TC0102 | Josh Whitney, Partner, Anthesis | Energy Management in Manufacturing TC0101-01

Environmental Footprint of Data Center and Office Hardware | There is no required disclosure for total GHG emissions from this category. This is a material result of energy consumption and not requiring a company to report this is a gap, as it will be challenging to produce this with the requested data. CDP, GRI Core, etc. requires this and it makes sense to include as a roll up material figure herein as well.

[Additionally, for Software & IT Services, in relation to TC0102-01, which required disclosure on weighted average carbon intensity:] | SASB identifies industry-specific material sustainability issues for disclosure, and recommends accounting metrics that provide decision-useful information to investors regarding company performance on the issues. SASB does not aim to enable complete GHG emissions accounting for all industries and sectors. Please refer to comments above regarding the issue of energy management and the purpose of the related accounting metrics.

In the provisional standard for Software & IT Services, SASB has refined the energy metric, and removed the weighted average carbon intensity disclosure. |

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		TC0102-01 (a)	GHG intensity is material but so is aggregated total emissions to determine relative size.	
TC0101	Josh Whitney, Partner, Anthesis	Product Lifecycle Management TC0101-10.38-39	The criteria defined in .38 & .39 is fairly open ended, and without more rigor may not provide an accurate or meaningful estimation of how progressive / focused a company is at incorporating DfE into its products.	Comment addressed. In its provisional standards, SASB has refined the Product Lifecycle Management metrics to focus on the use of IEC 62474 declarable substances, the percentage of eligible products meeting EPEAT standards, and the recycling rates of end of life materials. The EPEAT metric includes a discussion and analysis-based note directing companies to provide a discussion of their approach to incorporating environmentally-focused principles into product design.
TC0102	Josh Whitney, Partner, Anthesis	Environmental Footprint of Data Center and Office Hardware TC0102-01 (b)	Additional guidance and methodology will be required to enable companies to report accurately their colocation equipment (owned, operated) that is in other data centers (i.e. retail cloud or managed hosting providers) as these 3rd parties are not yet likely able to, or willing to report this information. Under reporting the energy footprints of this sector is a huge problem presently, in particular for the multi-tenant data center, colocation and managed hosting data center providers. In some cases, the equipment operated in colo[cation] environments represent a large, under-reported Scope 2 emissions category, let alone business risk related to D&R and continuity planning. This is less of a challenge for public hypserscale cloud providers who own and operate most or all of their data centers. This is definitely a material issue, but my recommendation is that further guidance from organizations like The Green Grid and others will be need to drive actual reporting of this metric.	Please refer to response above regarding owned and co-located data centers and outsourced operations.
TC0102	Josh Whitney, Partner, Anthesis	Environmental Footprint of Data Center and Office Hardware TC0102-02	Suggest that the word "operated" is added to the definition of this metric. And potentially that these two categories are broken out While many corporates operate their own data centers, colocation and cloud computing is driving many to outsource this as a service, however these providers most often do not provide any operational metrics, such as environmental and energy performance. In many instances, companies are using wholesale or retail colocation services where their owned hardware is placed in a data center which is operated by a 3rd party, with infrastructure cooling management responsibility. This determines the significant portion of the PUE factor. Presently, this	Please refer to response above regarding owned and co-located data centers and outsourced operations. Also, for reasons discussed above, SASB has made reporting of the PUE metric optional in the provisional standard.

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			segment is operating with the lowest PUE's reported, and while the 2013 Uptime Institute cited an average PUE of 1.65 today from their 1,000 company survey, another from Digital Realty Trust (which operates/ sells many colo[location] environments) cited 2.9, with only 20% below 2.0.	
All	Felicitas T. Irungu, CPA, FELIKAR & Associates	Disclosure topics not included in standards that may be material to reasonable investor	1. Brand management and reputation risk: consider inclusion of processes and measurement criteria as a material issue Technological failure is a big risk to the reputation of an organisation. **Governance** 1. Most corporate failures have been due to poor governance: consider disclosures of governance structure/mechanism, evaluating performance for instance compliance with governance codes, and how non-compliance is dealt with. IT Governance is crucial for the success of organizations today with the high dependence on IT in business and public organizations. 2. Stakeholder Engagement Stakeholder engagement is crucial as IT being an enabler supports nearly all organisations. Feedback from stakeholders is required on a regular basis to determine whether their concerns are being addressed, as IT support is widely required in many organizations and sectors and there are varied risks and exposures and requiring specialised solutions. Thus consider disclosure of the level and frequency of stakeholder engagement. **Security Breaches** 1. Consider disclosure for existence of Know Your Customer (KYC) programs and how monitored, especially with interconnectedness of systems with suppliers, customers and trading partners.	SASB standards for Software & IT Services and Telecommunications already include the topic of Managing Systemic Risks from Technology Disruptions. SASB evaluates the materiality of sustainability issues on an industry-specific basis. SASB follows its Conceptual Framework in looking at five broad categories of issues. These include: Environment, Social Capital, Human Capital, Business Model & Innovation, and Leadership & Governance. SASB has already identified the material sustainability issues related to Governance for the six industries in the Technology & Communications sector. SASB's evidence-based approach has already identified data and product security as a material sustainability issue in four of the six industries in the Technology & Communications sector.
All	Felicitas T. Irungu, CPA, FELIKAR & Associates	Supply Chain Management & Materials Sourcing	1.Regulator Compliance and Quality Control: Consider including issues arising from regulatory compliance and quality control audits and how the mechanism in place to address them	Where relevant, SASB considers the impact of regulations and regulatory risks on company value and provides accounting metrics to identify company performance on related material sustainability issues that give rise to such risks.

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		TC0101-14 TC0103-15		
All	Felicitas T. Irungu, CPA, FELIKAR & Associates	Delivering Sustainability Solutions for Customers TC0102-18	There are emerging IT risks as technology and operating environment changes and the need for R&D should be emphasized. Consider Mandatory contribution to R&D, possibly through the regulators, in addition to own company or organization allocation to R&D	SASB is engaged in the creation and dissemination of sustainability accounting standards for use by publicly-listed corporations in disclosing material sustainability issues for the benefit of investors and the public. SASB does not play a role in creating new regulations mandating contribution to R&D. SASB's evidence-based approach suggests that the issue of Delivering Sustainability Solutions to Customers does not meet the materiality threshold at present, and is considering the issue as an emerging one, not included in the provisional standards.
TC0301	Felicitas T. Irungu, CPA, FELIKAR & Associates	Managing Systemic Risks from Technological Disruptions TC0301-15	With wide usage of technology consumer and user education for sustainability. Organisations should have systems and policies to ensure there is continuous education especially with rapid technological changes and systemic risks and this needs to be disclosed.	SASB identifies sustainability accounting metrics for disclosure according to the criteria for such metrics outlined in the Conceptual Framework.
TC0301	Felicitas T. Irungu, CPA, FELIKAR & Associates	Data security TC0301-08	With increased use of technology for money transfers data security is paramount. There is need to disclose incidents of violations and how dealt with as a deterrent for further crimes.	SASB's provisional standards for the Telecommunications industry include a quantitative metric covering number of data security breaches and percentage involving customers' personally identifiable information. The metric requires companies to describe corrective actions implemented in response.
TC0401	Felicitas T. Irungu, CPA, FELIKAR & Associates	Intellectual Property Protection and Competitive Behavior TC0401-18	There is wide use of internet and media in business today and there are also increased risks and exposures. Cyber crimes and cross border risks are prevalent in many organizations, but some may be unknown to the business, due to interconnectedness with suppliers, customers and trading partners. There is need for disclosure on how these risks are identified and addressed, including intellectual property violations and how addressed.	SASB's provisional standards for Internet Media & Services companies include sustainability accounting metrics according to the criteria for such metrics outlined in the Conceptual Framework, and are directly related to, or are proxies for, company performance on the material sustainability issue described in the standard.

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TC0401	Felicitas T. Irungu, CPA, FELIKAR & Associates	Employee Recruitment, Inclusion, and Performance TC0401-16	Measurement of employee level of engagement: consider extending to include level of engagement and contribution to growth and profitability	In the provisional standards for Internet Media & Services, SASB has included a metric on employee engagement as a percentage, including a description of methodology employed. Disclosures on the level of engagement and contribution to growth and profitability do not fulfil SASB's criteria for metrics, as outlined in the Conceptual Framework.
All	Felicitas T. Irungu, CPA, FELIKAR & Associates	Cost Effectiveness	In the first year non-financial information is difficult to collect, analyze and report but in subsequent years would become easier. How costly depends on the current status of information available and systems in use. [Regarding whether cost is a barrier to adoption:] Yes it would be a barrier in the initial stage, but can be perfected over time, possibly encourage reporting in phases for fist time reporters so that they are able to fix their systems where necessary and make subsequent reporting smoother. [Regarding aspects of reporting most costly for reporting:] 1. Measurement of performance of HR and other functions not directly contributing to profitability including executives 2. Given the technical nature of IT there is heavy reliance on few who have the expertise and sometimes external parties which poses additional risks in terms of data integrity thus reliability. These are hidden risks which will be difficult to measure and report.	SASB aims to develop cost-effective disclosure on material sustainability issues.
TC0102 TC0103	Kathrin Winkler, SVP, Corporate Sustainability, EMC	All	The respondent raises the concern that issues faced by enterprise, B2B technology companies may differ from those producing consumer electronics. Companies will also differ by the extent of manufacturing performed in-house, and the extent of public cloud services provided. Proposed accounting metrics therefore need to be accompanied by the operating context. Note: Due to the nature of the file submitted, comment excerpts cannot be included here directly.	Comment addressed. In its provisional standards for all industries, SASB has introduced Activity Metrics to allow for normalization of sustainability accounting metrics across a number of aspects that will contextualize the disclosures. For Software & IT Services, for example, this includes the amount of data processing and data storage capacity, including the amount outsourced or co-located. For Hardware companies, this includes, for example, the number of units produced by product category, and the percentage of production from owned facilities.

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TC0103	Kathrin Winkler, SVP, Corporate Sustainability, EMC	Energy Management in Manufacturing TC0103-01	The respondent comments that data center energy consumption is not accounted for in the energy metric for Hardware companies. Also, some companies outsource all manufacturing. Specific comments on technical protocols seek clarification on scope of reporting and need for expressing energy consumption in terms of energy content. Note: Due to the nature of the file submitted, comment excerpts cannot be included here directly.	As discussed above, the provisional standards clarify that "For the purposes of this standard, it is assumed that Hardware companies outsource a significant proportion of product manufacturing activities…" SASB develops sustainability accounting standards for activities typical of the industry classified under the Sustainable Industry Classification System (SICS™), as defined in the Introduction to each standard. However, some Hardware companies own or operate large data centers and provide software or IT services. Some companies may have significant in-house manufacturing operations. SASB has therefore published a Technical Bulletin accompanying the standards, providing disclosure guidance for integrated Technology & Communications sector companies, including Hardware companies with in-house manufacturing operations. Feedback from industry working groups and further research by SASB did not find sufficient evidence to support materiality of energy consumption for manufacturing activities related to hardware products other than those in the Semiconductors industry. SASB has therefore removed the issue of energy management in manufacturing from the provisional standards for the Hardware and EMS & ODM industries.
TC0103	Kathrin Winkler, SVP, Corporate Sustainability, EMC	Water & Waste Management in Manufacturing TC0103-02 TC0103-03	The respondent requested clarification that the metrics TC0103-02 and TC0103-03 are only for manufacturing facilities, as the data requested would be difficult to ascertain for office environments. The respondent also questioned SASB choosing a particular certification scheme (e-Stewards). Note: Due to the nature of the file submitted, comment excerpts cannot be included here directly.	Please see response above regarding the Technical Bulletin for integrated companies in the Technology & Communications sector. In the provisional standard for the Hardware industry, SASB has removed the issue of Water & Waste Management in Manufacturing. However, the Technical Bulletin provides guidance for reporting on water and waste management in manufacturing for Hardware companies with significant in-house manufacturing operations. The related metrics are similar to those for the issue of Water & Waste Management in Manufacturing for the EMS & ODM industry. In the provisional standard for the EMS & ODM industry, SASB has expanded the metric to explicitly encompass both e-Stewards and R2 standards, as well as other

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				standards which a company may use. The disclosure now must identify the standards to which recyclers are compliant.
TC0103	Kathrin Winkler, SVP, Corporate Sustainability, EMC	Data Security Products TC0103-04	The respondent noted that identifying the rationale for data security on a product-by-product basis would be repetitive without adding value. The respondent also raised concerns about requiring disclosure of revenue related to data security. Note: Due to the nature of the file submitted, comment excerpts cannot be included here directly.	Comment addressed. Considering the comment, and in an effort to streamline metrics and ensure they meet the criteria laid out in the Conceptual Framework, SASB has revised the metric for product security into a discussion and analysis-based disclosure. The disclosure requires companies to provide a discussion of their approach to identifying and addressing data security risks to new and existing products.
TC0103	Kathrin Winkler, SVP, Corporate Sustainability, EMC	Employee Recruitment and Inclusion TC0103-06 TC0103-07	The respondent noted for TC0103-06.21 that it is often extremely difficult to isolate a single recruitment program as having been responsible for particular hiring, and asked whether the disclosure needs to be itemized. The respondent noted for TC0103-07.22 that the gender and ethnic group categories are U.S.-centric. Note: Due to the nature of the file submitted, comment excerpts cannot be included here directly.	Comment addressed. Based on further research, SASB has retained only the aspect of employee diversity and inclusion for the provisional Hardware standard, as being the material element of human capital management for the industry. The disclosure topic is now "Employee Inclusion". Accordingly, SASB has retained only the metric on the gender and racial/ethnic diversity of employees of Hardware companies. Additionally, the technical protocol (TC0103-02.11 of the provisional standard) clarifies that: "Where racial/ethnic group and/or gender representation percentages are significantly influenced by the country or region where the workforce is located, the registrant shall provide contextual disclosure to ensure proper interpretation of results… Where relevant the registrant may provide supplemental breakdown of gender and racial/ethnic group representation by country or region."
TC0103	Kathrin Winkler, SVP, Corporate Sustainability, EMC	Product Lifecycle Management TC0103-08 TC0103-10	The respondent noted for TC0103-08 that companies producing large-scale, highly configurable enterprise products track RoHS by part, rather than by product. The respondent also noted that companies often do not track information on the percentage of RoHS products sold in the U.S. and other jurisdictions where that law does not apply.	Based on feedback received, SASB has refined the Product Lifecycle Management metrics to focus on the use of IEC 62474 declarable substances, the percentage of eligible products meeting EPEAT standards, and the recycling rates of end-of-life materials. The EPEAT metric includes a discussion and analysis-based footnote directing companies to provide a discussion of

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		TC0103-11	Regarding TC0103-10, the respondent raised concerns around reporting by revenue and highlighted that most voluntary schemes such as ENERGYSTAR do not certify products but rather, specific product configurations. Regarding TC0103-11, the respondent provided specific comments on the terminology used in the metric and technical protocols. In addition, the respondent commented that it is not necessary to report the amount of e-waste, or if it is included, it should be accompanied by a specific definition. The respondent reiterated that it is inappropriate for SASB to choose a particular certification scheme such as e-Stewards. <u>Note</u>: Due to the nature of the file submitted, comment excerpts cannot be included here directly.	their approach to incorporating environmentally focused principles into product design. Additionally, SASB has expanded the e-waste metric to explicitly encompass both e-Stewards and R2 standards, as well as other standards which a company may use. The disclosure now must identify the standards to which the recyclers are compliant. With the revised metrics in the provisional standard, SASB has also addressed the respondent's detailed comments on the technical protocols.
TC0103	Kathrin Winkler, SVP, Corporate Sustainability, EMC	Supply Chain Management TC0103-13 TC0103-14	The respondent commented that TC0103-13 would be time consuming to report, and that it is often a confluence of causes that results in a shortfall, rather than a single issue. Regarding TC0103-14, the respondent commented that having a single location of suppliers may be a bigger risk than whether a supplier is sole-source. Furthermore, Tier 1 supplier diversity may not reflect a bottleneck in Tiers 2 or 3. The respondent requested clarification on the technical protocols related to the metric (TC0103-14.53 and TC0103-14.56) and provided suggestions to modify the metric. <u>Note</u>: Due to the nature of the file submitted, comment excerpts cannot be included here directly.	In the provisional standards for the Hardware industry, SASB has refined the Supply Chain Management metrics to focus on dependence on critical materials and conflict minerals, and supplier audits and compliance rates. The production shortfall metric has been revised to a discussion and analysis-based disclosure directing companies to provide a discussion of their approach to managing the risks associated with critical materials and conflict minerals. SASB believes that these modifications substantially address the respondent's concerns.
TC0102	Kathrin Winkler, SVP, Corporate Sustainability, EMC	Environmental Footprint of Data Center and Office Hardware TC0102-01 through TC0102-04	The respondent questions the materiality of the issue, stating that many software companies do not run their own data centers. Many are also hardware companies, and data centers represent a small contribution to energy use or GHG emissions for such companies. The respondent recommends separating public cloud service providers from software providers. The respondent requests clarification on the term "office hardware," and asks for a specific definition of co-location equipment, as there is	SASB's research and stakeholder feedback shows that the environmental footprint of hardware infrastructure is likely to be material for the Software & IT Services and Internet Media & Services industries. Leading publicly-listed companies in the Software & IT Services industry, accounting for a significant proportion of industry revenues, own several large data centers and software development labs globally, and offer public cloud services. Public

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			potential for ambiguity in relation to "infrastructure as a service." The respondent also indicated that requesting energy consumption of co-located equipment may significantly increase operating costs. The respondent made additional comments on the technical protocols related to these metrics. Note: Due to the nature of the file submitted, comment excerpts cannot be included here directly.	cloud-computing and Software-as-a-Service are expected to expand further. Smaller Software & IT Services companies may primarily utilize cloud-services by other providers for their data storage and processing needs. Their direct environmental footprint therefore may not be significant. However, energy costs or reliability of supply may nevertheless be material for the operations of such companies. Ultimate determination of materiality will depend on the company's operating context. In its provisional standards, SASB has revised the scope of the energy metric to encompass only energy consumed by entities owned or controlled by the organization. This would include all energy consumed by such entities, irrespective of whether it is used for owned data centers or other IT equipment. However, for companies with significant owned or controlled data centers, SASB expects that much of the energy consumed and reported by the registrant could be attributed to such data centers. SASB has further introduced Activity Metrics to allow for normalization of all sustainability accounting metrics across a number of aspects that will characterize the disclosures. This includes the amount of data processing and data storage capacity, including the amount outsourced or co-located. SASB develops sustainability accounting standards for activities typical of the industry classified under the Sustainable Industry Classification System (SICS™), as defined in the Introduction to each standard. However, some Hardware companies own or operate large data centers and provide software or IT services. SASB has published a Technical Bulletin, providing disclosure guidance for integrated Technology & Communications sector companies, including companies with hardware and software operations. See SASB responses on this disclosure topic to other comments above.

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TC0102	Kathrin Winkler, SVP, Corporate Sustainability, EMC	Data Privacy and Freedom of Expression TC0102-05 TC0102-06 TC0102-08	Regarding TC0102-05, the respondent strongly encourages the use of the term "personal data" rather than "data," which is ambiguous. Regarding TC0102-06.27, the respondent raises the concern that public disclosure could violate confidentiality restrictions and/or lead to a compromise of security measures. Regarding TC0102-08.31, the respondent raised the concern that a company's off-the-shelf product may be part of a third-party solution performing the monitoring, and the company may not have visibility to end-use. The respondent sought clarification on the term "percent of customers affected." Note: Due to the nature of the file submitted, comment excerpts cannot be included here directly.	For the provisional standard, SASB has revised the data privacy metrics to provide clarity on types of data. The metrics focus on the use of personally identifiable information or customer information, which includes demographic, location, and behavioral data, as well as records and content of communications. The metric on legal and regulatory fines and settlements associated with customer privacy now includes a technical protocol clarifying that "All disclosure shall be sufficient such that it is specific to the risks the registrant faces, but disclosure itself would not compromise the registrant's ability to maintain data privacy and security." The scope of SASB disclosures generally includes activities or impacts over which a company has control or influence. For example, a company would disclose on its compliance with direct government requests for data or for modification of its products or services. Additionally, if a government has banned or blocked a company's products or services, it should disclose the nature of the ban. In cases where a downstream user of a company's products or services makes use of that product or service in such a way as to monitor or censor other entities, SASB would expect the downstream customer to disclose on their own actions.
TC0102	Kathrin Winkler, SVP, Corporate Sustainability, EMC	Data Security TC0102-09 TC0102-10	Regarding TC0102-09, the respondent asked for clarification on the terms "breach of information" or "data" and "compromise" of data. Similar to the concern on data privacy, the respondent notes that public disclosure could violate confidentiality restrictions and/or lead to a compromise of security measures. Furthermore, the disclosure in TC0102-10 addresses a static set of threats, which may not keep pace with emerging threats. Disclosure required in TC0102-10.42 is new and may be premature to include. Note: Due to the nature of the file submitted, comment excerpts cannot be included here directly.	For the provisional standard, SASB has revised the Data Security metrics to focus on breach of personally identifiable information. The metric defines data security breaches. Also included is a discussion and analysis-based disclosure directing companies to provide a discussion of their approach to identifying and addressing data security risks. This provides the same clarification on compromise of security measures, as mentioned above in relation to data privacy. In addition, the registrant may choose to, but is not required to, reference the NIST Framework for Improving Critical Infrastructure Cybersecurity, Version 1.0.

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TC0102	Kathrin Winkler, SVP, Corporate Sustainability, EMC	Employee Inclusion & Performance TC0102-16	The respondent notes that pay progression is not necessarily an indicator of performance. Note: Due to the nature of the file submitted, comment excerpts cannot be included here directly.	Comment addressed. SASB has removed this metric from the provisional standard. The revised metrics for this disclosure topic have been streamlined to focus on material aspects of the issue.
TC0102	Kathrin Winkler, SVP, Corporate Sustainability, EMC	Delivering Sustainability Solutions for Customers TC0102-18	The respondent raised several concerns about the disclosure topic and metrics. According to the respondent, it may not be feasible to separate either revenue or customer segment to focus on products enabling positive environmental and social impacts in their end use. Furthermore, the disclosure may include competitive, sensitive information, which should not be required. Note: Due to the nature of the file submitted, comment excerpts cannot be included here directly.	SASB will monitor the issue of Delivering Sustainability Solutions for Customers as an emerging issue, and is not including it in provisional standards, as evidence and stakeholder feedback indicates the issue does not meet the materiality threshold at present.
TC0102	Kathrin Winkler, SVP, Corporate Sustainability, EMC	Managing Systemic Risks from Technology Disruptions TC0102-19	The respondent asked that "unplanned downtime" should be specified, and the metric should not include planned downtime. The respondent also raised the concern that disclosure TC0102-19.77 has real potential to lead to greater security threats. Note: Due to the nature of the file submitted, comment excerpts cannot be included here directly.	For the provisional standards, SASB has revised the metrics for this disclosure topic to focus on (1) the number of performance issues and service disruptions and (2) total customer downtime. Additionally, SASB includes a discussion and analysis-based disclosure directing companies to provide a discussion of business continuity risks related to disruptions. The metrics focus on performance with respect to the frequency and length of interruptions to a company's delivery of service to a customer. Therefore, SASB makes no distinction between, and retains, both planned and unplanned downtime resulting from performance issues and service disruptions, as either has potential to cause an interruption in service to customers.
TC0102	Kathrin Winkler, SVP, Corporate Sustainability, EMC	IP Protection & Competitive Behavior TC0102-22	The respondent proposed that the title should reflect "Anti" competitive behavior rather than Competitive Behavior. According to the respondent, it is important to provide clear context regarding the impact of anti-competitive behavior and IP. The respondent suggests language to make the distinction clear between the proper uses of IP vs. anti-competitive behavior.	SASB acknowledges the important role of IP protection, and believes the revised issue description in the provisional standards sufficiently highlights that the issue is focused on the specific cases when IP is used for anti-competitive behavior. The title of the disclosure topic is intended to be neutral. SASB's revised Industry Brief for the Software & IT Services industry (for sale online) discusses the details of the issue in a manner consistent with the respondent's suggestion.

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			The respondent notes that the proposed metrics are broad and may capture immaterial information, or information not reflective of actual findings of anti-competitive behavior. Note: Due to the nature of the file submitted, comment excerpts cannot be included here directly.	In the provisional standards, SASB has revised the metrics for this disclosure topic to be more specific and focused. The revised metric includes number of patent litigation cases in which the registrant was involved as either the patent holder or patent challenger, the success rate with respect to patent ligation, number of cases involved in as patent holder, as well as fines and settlements associated with anti-competitive practices. The fines and settlements metric includes a discussion and analysis-based footnote directing companies to briefly describe the nature and context of fines and settlements (e.g., guilty plea, deferred agreement etc.).
All	Dr. Jarlath Molloy, Technical Manager, CDSB	General	The provisions contained within the draft standards [both Financials and Technology & Communications sectors] represent significant progress in establishing the basis for non financial reporting. […] We recognize the language, provisions and substance of the draft standards and endeavor to ensure consistency in our updated Framework. We suggest SASB likewise reference the work of CDSB, as appropriate. […]	Comment noted. SASB continues to work with CDSB and references CDSB in the provisional standards as appropriate.