



## Supplement to Standards Outcome Report

### Renewable Resources & Alternative Energy

This is a supplement to the Standards Outcome Review report for the Renewable Resources & Alternative Energy sector, prepared for the SASB Standards Council meeting on June 18, 2015. This supplement contains detailed feedback from SASB Industry Working Groups (IWG) for this sector. The Standards Outcome Report addresses these comments, and based on a review of the comments and additional research, the SASB Standards Development team will put forward for a 90-day public comment period (PCP) on July 7, 2015, accounting standards for the six industries (six, following the split of Forestry & Paper into two industries as discussed in the Outcome Report) in the Renewable Resources & Alternative Energy sector.

#### Section 1

This section provides the percentage of IWG members that determined the likely materiality for each issue in an industry, for all five industries put forward to the IWGs. Green bars indicate that the IWG respondent agrees that the issue is likely to constitute material information, red bars indicate that the IWG respondent disagrees, and blue bars indicate that the IWG participants consider that the issue may be material, but have reservations. These responses determine which issues the SASB Standards Development team investigates further in greater detail to present disclosure topics for public comment.

#### Section 2

Section 2 lists the comments received during the IWG, including: the industry, disclosure topic<sup>1</sup>, question type on the survey, interest group, suggested disclosure topic where IWG members suggested adding a topic, response to whether an issue presented to the IWG is considered material, and detailed comments.

Comments related to issues on which there was IWG consensus regarding materiality will be considered when creating issue descriptions for the sustainability accounting standards, and revising industry briefs.

Comments related to other issues have been considered when revising or eliminating issues as being likely to constitute material information, as discussed in the Standards Outcome Review report.

Comments related to suggestions for new issues have been considered when adding disclosure topics to an industry, as discussed in the Standards Outcome Review report.

All other comments relate to industry definitions, SASB's overall approach, and IWG participation experience, and will be considered for process improvements.

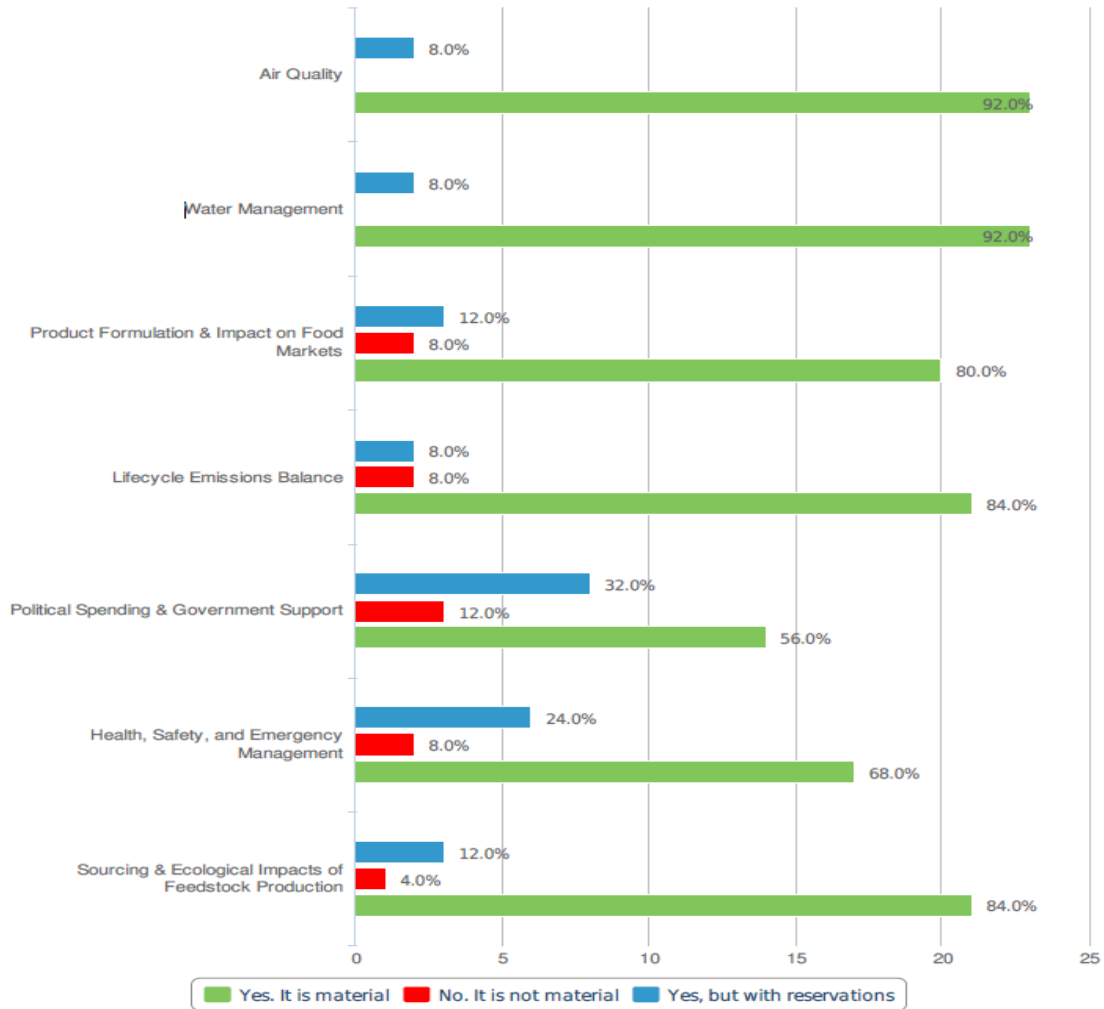
---

<sup>1</sup> In cases where general comments were made that related to a sustainability topic already presented by SASB for an industry, these comments have been mapped back to the topic.



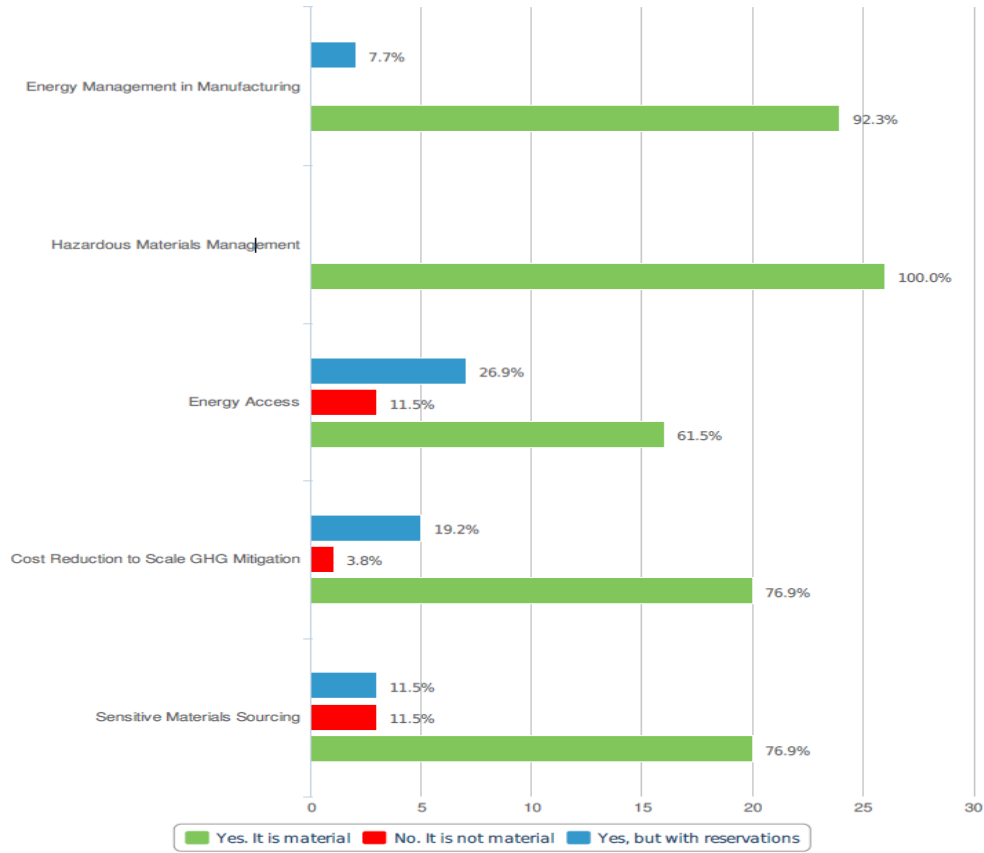
Section 1 - IWG Assessment of Materiality

**Biofuels**

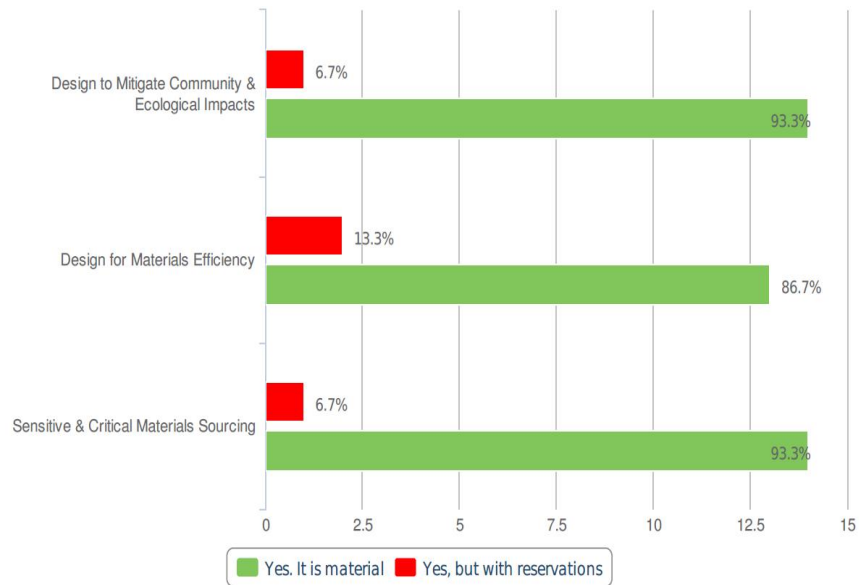




## Solar Energy

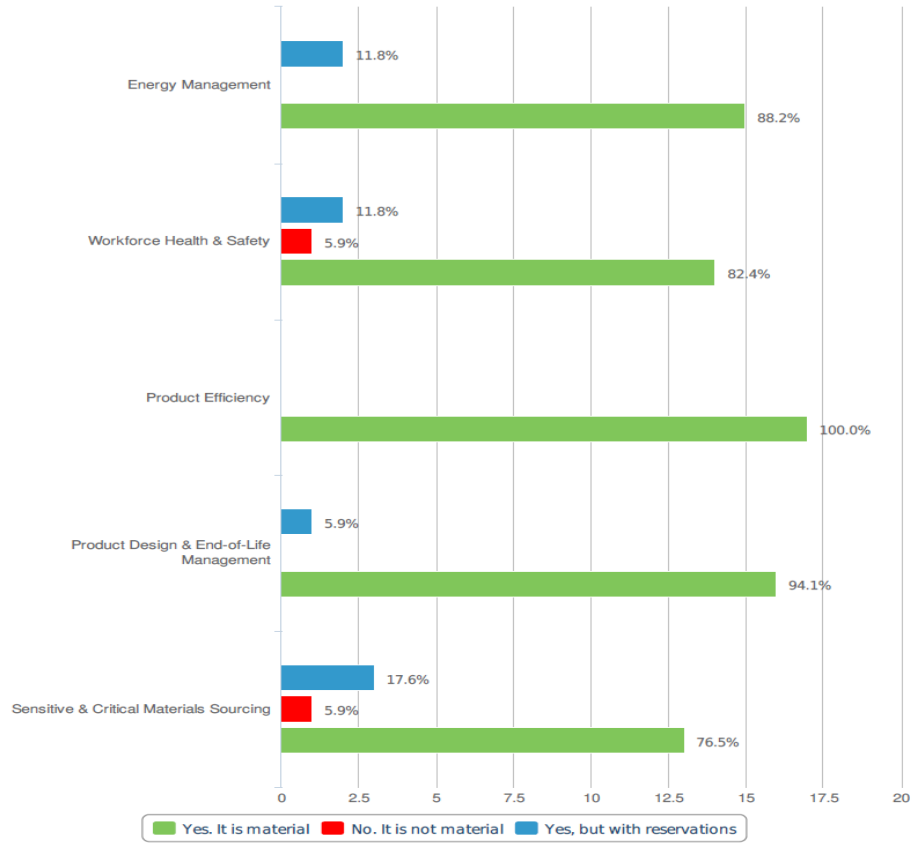


## Wind Energy



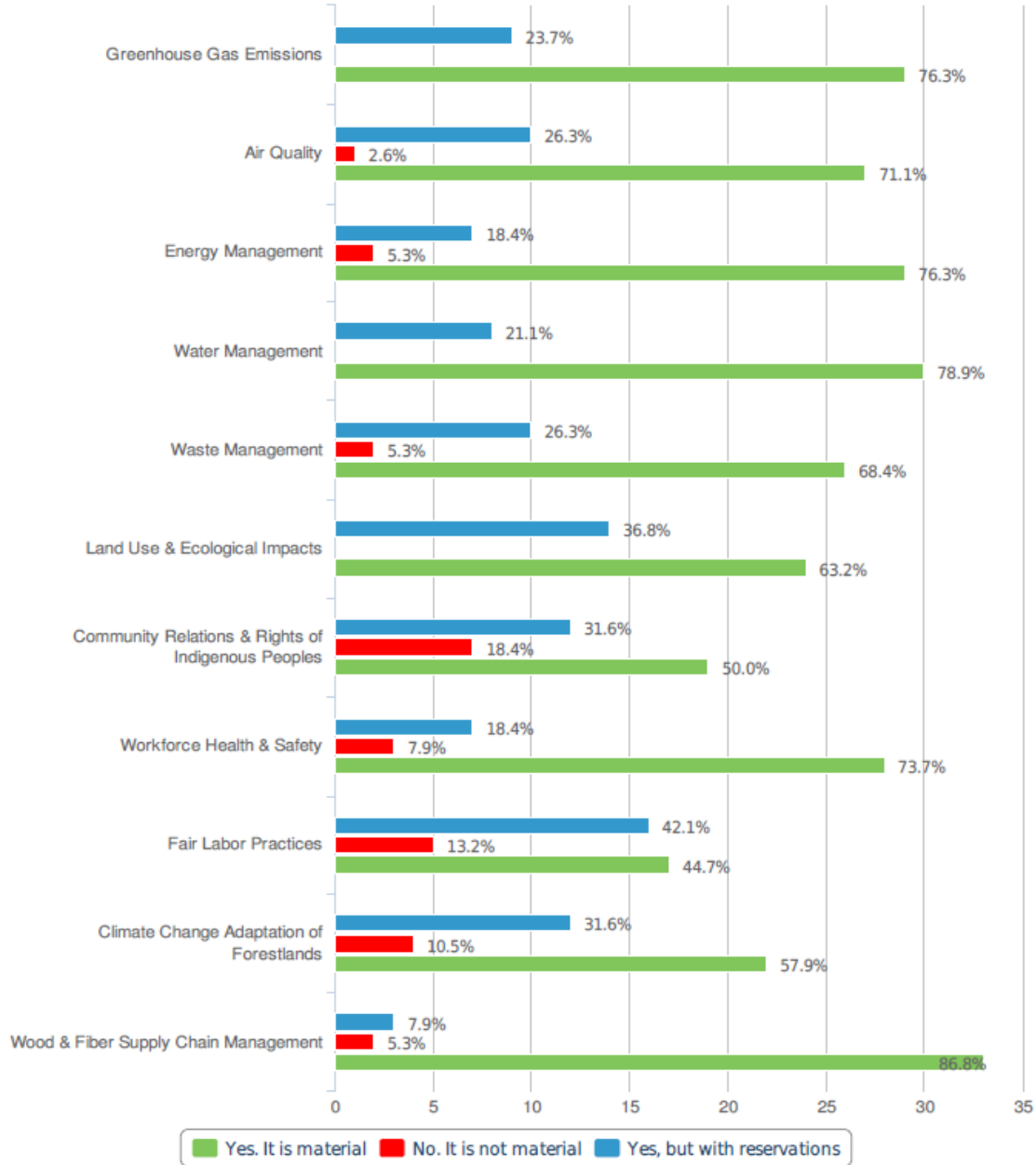


## Fuel Cells & Industrial Batteries





## Forestry & Paper





**Section 2 - IWG Comments on Disclosure Topics**

Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Air Quality	Material Issue?	Corporations	Yes	Violations of the Clean Air Act can be extremely costly and there is no statute of limitations. Such violations may also indicate that plant personnel are knowingly violating those limits in pursuit of production goals.  <a href="http://epa.gov/ozone/enforce/index.html">http://epa.gov/ozone/enforce/index.html</a>  <a href="http://www2.epa.gov/enforcement/criminal-provisions-clean-air-act">http://www2.epa.gov/enforcement/criminal-provisions-clean-air-act</a>  <a href="http://www.epa.gov/ttn/caaa/t6/memoranda/608_pp.pdf">www.epa.gov/ttn/caaa/t6/memoranda/608_pp.pdf</a>  <a href="http://www.epa.gov/air/caa/peg/permits.html">http://www.epa.gov/air/caa/peg/permits.html</a>
Biofuels	Air Quality	Material Issue?	Corporations	Yes	Air quality is generally applicable, but it would be helpful to use CDP reporting as the default in order to reduce the reporting burden, encourage more participation, and provide consistency and quality control.
Biofuels	Air Quality	Material Issue?	Corporations	Yes	Government subsidy and Competing for land for food production is a major impact. As the other ones hold good even with conventional oil and gas ( water, air emissions,etc)
Biofuels	Air Quality	Material Issue?	Corporations	Yes	regulations over carbon emissions continue to increase with CA, OR, WA and British Columbia now regulating carbon emissions.
Biofuels	Air Quality	Material Issue?	Market Participant	Maybe	It is not clear to me that the risks posed by biofuels in air quality differ from those in agriculture.
Biofuels	Air Quality	Material Issue?	Market Participant	Yes	Regulatory schemes like the RFS2 and LCFs are linked to LCA analysis of biofuels
Biofuels	Air Quality	Material Issue?	Market Participant	Yes	Regulatory risk
Biofuels	Air Quality	Material Issue?	Market Participant	Yes	Air quality regulations can have a great impact on production and also be the source of fines for companies violating emissions standards.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Air Quality	Material Issue?	Public Interest & Intermediaries	Maybe	Air quality is significant, but it is usually a regional issue, with many contributing factors. Individual company or facility emissions play only a small overall role in air emission issues.
Biofuels	Air Quality	Material Issue?	Public Interest & Intermediaries	Yes	As described in the brief, most large scale biofuel production facilities are subject to air permit requirements, in particular as they pertain to emissions from point sources such as boiler stacks. Air emissions violations by biofuel facilities are not uncommon. It should be noted that the Roundtable on Sustainable Biomaterials (RSB) requires that commercial facilities inventory all potential emissions point sources, and implement Best Available Control Technologies when possible, or else explain why the implementation of BACT to prevent emissions is not feasible.



Biofuels	Air Quality	Material Issue?	Public Interest & Intermediaries	Yes	<p>My organization (XXX) has produced several reports on the combustion biomass industry (burning biomass in power plants to generate electricity). We have not focused on the biofuel industry. Nonetheless, some of our work is relevant to the biofuel industry, especially as “advanced” biofuels are increasingly promoted. Advanced biofuels (derived from cellulosic feedstocks) will increasingly compete for the same fuels that are used in combustion bioenergy, including wood. Further, since many biofuels plants burn biomass left over after the refining process for energy, this means that some of the issues we’ve identified for the biomass-to-electricity sector directly pertain to the biofuels industry, including air pollution. Thus, for responses to this survey, I am including material about the biomass-to-electricity sector, where it seems relevant.</p> <p>Biofuel and biomass energy production is intensely polluting. Ethanol plants are big polluters; and biomass power plants emit as much or more air pollution as coal plants, per unit energy generated. However, these technologies are frequently described to investors and consumers as “clean.” We filed three comprehensive reports on the biomass power sector pertaining to air pollution and carbon pollution by biomass power plants. One was a complaint to the SEC, accompanied by a letter signed by investors with over \$100 b assets under management (press release at <a href="http://www.pfpi.net/investors-to-sec-please-scrutinize-bioenergy-claims">http://www.pfpi.net/investors-to-sec-please-scrutinize-bioenergy-claims</a>; report at <a href="http://www.pfpi.net/wp-content/uploads/2013/11/PFPI-report-to-SEC-on-bioenergy-Nov-20-2013.pdf">http://www.pfpi.net/wp-content/uploads/2013/11/PFPI-report-to-SEC-on-bioenergy-Nov-20-2013.pdf</a>); one was a complaint to the FTC (<a href="http://www.pfpi.net/wp-content/uploads/2014/07/PFPI-report-to-FTC-on-biomass-power-greenwashing.pdf">http://www.pfpi.net/wp-content/uploads/2014/07/PFPI-report-to-FTC-on-biomass-power-greenwashing.pdf</a>); and one was an overview of the technical reasons and legal loopholes that make biomass power plants so polluting (<a href="http://www.pfpi.net/wp-content/uploads/2014/04/PFPI-Biomass-is-the-New-Coal-April-2-2014.pdf">http://www.pfpi.net/wp-content/uploads/2014/04/PFPI-Biomass-is-the-New-Coal-April-2-2014.pdf</a>).</p>
----------	-------------	-----------------	----------------------------------	-----	---





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
					With regard to biofuels manufacturing being very polluting: here is a recent example of a plant that received a fine: <a href="http://www.biofuelsdigest.com/bdigest/2014/03/11/wisconsin-ethanol-plant-fined-125000-for-air-pollution-permit-violations/">http://www.biofuelsdigest.com/bdigest/2014/03/11/wisconsin-ethanol-plant-fined-125000-for-air-pollution-permit-violations/</a>
Biofuels	Air Quality	Material Issue?	Public Interest & Intermediaries	Yes	air quality violations can have substantial impact on the company's license to operate, and also a direct impact on profit (given that the costs of fines can be substantial).
Biofuels	Air Quality	Material Issue?	Public Interest & Intermediaries	Yes	One thing that is not mentioned in the draft industry brief is the economic benefit derived as a result of cleaner air emissions relative to fossil fuels in biofuel transport fuel blends. The improvement of air quality is a key driver for government support and incentivization. ON the negative side, Isoprene can be released to the atmosphere with wood based fuels.
Biofuels	Air Quality	Material Issue?	Public Interest & Intermediaries	Yes	W r t Air Quality, a potential risk exists for emerging advanced biofuel production in demonstrating they meet or exceed air quality standards. This is particularly true in California, where working through the ARB may significantly delay the approval for advanced biofuel products in a large market that is currently underserved.
Biofuels	Congratulations	Other Comment	Market Participant	D.N.A. - Other Comment	I thought the research brief was excellent. One of the best overviews of the industry I have read. And critical background for completing the questionnaire.
Biofuels	Congratulations	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	I thought the process was very clear and the research brief provided very detailed, useful information. I felt very prepared to fill out this survey. Thank you for the opportunity!
Biofuels	Health, Safety, and Emergency Management	Add Issue	Corporations	Process Safety Management	Process safety management is a regulation, promulgated by the U.S. Occupational Safety and Health Administration (OSHA). A process is any activity or combination of activities including any use, storage, manufacturing, handling or the on-site movement of highly hazardous chemicals (HHCs) as defined by OSHA and the Environmental Protection Agency. Executive Order 13650 is requiring EPA and OSHA to update and increase oversight on the PSm and RMP standards which can potentially have a huge impact on an already weak industry in this area.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Health, Safety, and Emergency Management	Material Issue?	Corporations	Maybe	Again, normalization is necessary for comparability.
Biofuels	Health, Safety, and Emergency Management	Material Issue?	Corporations	Yes	Safety infractions, poor EMR ratings, strongly impact workers comp and insurance costs, as well as being reflective of the culture at the plant.
Biofuels	Health, Safety, and Emergency Management	Material Issue?	Corporations	Yes	Always an important issue when producing oil. Specifically the environment aspects
Biofuels	Health, Safety, and Emergency Management	Material Issue?	Corporations	Yes	Provides a more longer-term perspective to investors and how the company is maintaining investor's assets.
Biofuels	Health, Safety, and Emergency Management	Material Issue?	Market Participant	Maybe	This area of consideration is slightly removed from the biofuels industry.
Biofuels	Health, Safety, and Emergency Management	Material Issue?	Market Participant	Maybe	I don't see how biofuels should be held to a different standard than any agricultural producer, given that the risks of labor, safety and health issues seem comparable to me. I think industry standards should be sufficient here.
Biofuels	Health, Safety, and Emergency Management	Material Issue?	Market Participant	Maybe	A high level of attention to health, safety and emergency management is assumed and expected as sound business practice in the U.S. Violations are rare and very public and it is in a company's interest to comply. Do not believe there is a need to disclose.
Biofuels	Health, Safety, and Emergency Management	Material Issue?	Market Participant	Yes	The cost of an accident can be very expensive and expose a producer to greater oversight from government agencies and liability from injuries and environmental damage. A catastrophic accident will also stand to stop production for a long period of time.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Health, Safety, and Emergency Management	Material Issue?	Public Interest & Intermediaries	Maybe	It should be disclosed absolutely, however the other issues are more material at this stage.
Biofuels	Health, Safety, and Emergency Management	Material Issue?	Public Interest & Intermediaries	Maybe	The biomass power and biofuels industries are fairly dangerous and accident-prone. There have been a number of fires and explosions at biomass energy facilities. However, in my opinion there is not necessarily any additional need for disclosure here, because unlike for the topics of environmental impacts, emissions, lifecycle carbon impacts, etc, the industry does not seem to be misrepresenting itself with regard to health and safety.
Biofuels	Health, Safety, and Emergency Management	Material Issue?	Public Interest & Intermediaries	No	I find this topic no more material per se to a biofuels company than any other industrial company
Biofuels	Health, Safety, and Emergency Management	Material Issue?	Public Interest & Intermediaries	No	This is a critical area of all businesses and not necessarily a sustainability consideration. It could become a material consideration if incident rates become elevated and corresponding insurance/ litigation costs are elevated for the sector. That being said, this is true for all industries as they manage risk in this area.
Biofuels	Health, Safety, and Emergency Management	Material Issue?	Public Interest & Intermediaries	Yes	Biofuel facilities are chemical processing plants, and as such, often have large volumes of toxic and flammable chemicals. The is usually industrial machinery that poses a danger to staff, and confined spaces (tanks) that can suffocate or drown individuals. Workplace accidents at biofuel facilities are very common, and in some cases go unreported. It should be noted that the RSB standard includes criteria related to workplace health and safety requirements.
Biofuels	Health, Safety, and Emergency Management	Material Issue?	Public Interest & Intermediaries	Yes	worker safety has been and continues to be an issue in this sector; I think the issue is critical in terms of keeping companies away from litigation issues and enticing them to keep up with this issue over time.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Ind. Brief comment	Other Comment	Market Participant	D.N.A. - Other Comment	I would have liked to learn more about next generation biofuels (v2 and v3) and think the brief should have provided more information on those topics.
Biofuels	Ind. Brief comment	Other Comment	Market Participant	D.N.A. - Other Comment	There was one type on page 26 of the brief. In paragraph one "Ann" is used instead of "An"
Biofuels	Ind. Brief comment	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	<p>Excellent and informative. Thank you for all the efforts that went into the consolidation and historical development of this sector.</p> <p>A few final comments,</p> <ol style="list-style-type: none"> <li>1. The fuel, water, energy nexus to GHG management is a very complex area that will require further industry research.</li> <li>2. The impact/ exposure to oil prices, consumer behavior in response to pricing will continue to effect this sector's long-term, sustained success.</li> <li>3. The automotive industry approach to bio-fuel, hybrid and electric vehicle design may impact sector growth, as will availability of alternative biofuel products at the pump.</li> <li>4. The impact of subsidies and incentives is an important consideration - what is the long term commitment to subsidies, how do they compare to subsidies offer for renewables and petroleum sectors, etc?</li> <li>5. Lastly, the current document does not seem to address opportunities for use of biofuel/ ethanol based products as an alternative to petroleum based products currently utilized in the manufacturing sector - I.e. use of biofuels in plastic production, implications on biodegradability of plastic products, etc. different mixes of production may expand market opportunities and lower overall risk and cost inherent in competing with oil and gas corporations.</li> </ol>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Industry insights	Add Issue	Public Interest & Intermediaries	Adherence to a certification standard	A voluntary, international social and environmental certification standard has been developed over the last 7 years. The standard is called the Roundtable on Sustainable Biomaterials (RSB), and it has requirements related to nearly all of the disclosure topics material to this industry. Companies should publicly disclose whether they participate in a voluntary certification program, such as RSB, as a means to mitigate their social and environmental risks.
Biofuels	Industry insights	Add Issue	Public Interest & Intermediaries	Research and Development Alliances	In my experience, companies who form smart alliances to promote research and development are much better positioned for success in bringing product to market as well as enjoying the benefit of shared risk and investment. The synergies and shared knowledge also promote greater success.
Biofuels	Industry insights	Inaccuracy	Corporations	D.N.A. - Inaccuracy	<p>not really inaccuracies but some omissions:</p> <p>DDGs are a big part of the revenue equation for many biofuel site - not mentioned on page 3 &amp; 4 financial margin paragraph. Chief entries to barriers also include access to feed stocks , as transportation cost are excessive when feedstock not in your immediate area - also page 3.</p> <p>Page 9 - to me carbon yield is the under pinning metric to many of the sustainability issues - this needs to be tracked and should be a major driver behind innovation.</p> <p>In the environmental section - no mention of antibiotics - there should be.</p>
Biofuels	Industry insights	Other Comment	Market Participant	D.N.A. - Other Comment	<p>This report provides a good overview of the industry.</p> <p>Many of the topics touched on have been covered in technical depth by such regulatory bodies as the EPA, CARB. And associations like the RBS.</p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Industry insights	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	I believe collaboration with others is a critical factor in determining success. Companies that form partnerships across a value chain including R&D, supply chain and operations appear to move faster to the market and have greater success. In addition building with usage infrastructure in place or developing it along side product development assists in determining success in the market.
Biofuels	Lifecycle Emissions Balance	Inaccuracy	Public Interest & Intermediaries	D.N.A. - Inaccuracy  [LIFECYCLE EMISSIONS BALANCE]	Your credulity on the topic of lifecycle accounting is too great. The lifecycle accounting that EPA currently engages in is profoundly flawed; further, it hasn't even been conducted for woody feedstocks.
Biofuels	Lifecycle Emissions Balance	Material Issue?	Corporations	Maybe	Reward/punishment is currently limited throughout the US and therefore establishing a common standard on which to report a company's performance is difficult. However, this is changing. Carbon scoring in CA for instance provides a means whereby companies can measure and be rewarded for reducing lifecycle emissions. This is of course limited to the west coast.
Biofuels	Lifecycle Emissions Balance	Material Issue?	Corporations	No	Aside from GHG reporting, there is little emphasis on this in the US. International standards can be met through ISCC certifications
Biofuels	Lifecycle Emissions Balance	Material Issue?	Corporations	Yes	It will be important throughout to normalize data by revenue attributable to biofuels production or your data sets will not be comparable.
Biofuels	Lifecycle Emissions Balance	Material Issue?	Corporations	Yes	The key economies have a biofuel policy - in varying degree of maturity. The lifecycle aspects across the entire valuestream of using biofuels is particularly important for Policy makers in Government while making decisions on promoting subsidies and supporting research.
Biofuels	Lifecycle Emissions Balance	Material Issue?	Market Participant	Yes	Regulatory schemes like the RFS2 and LCFs are linked to LCA analysis of biofuels



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Lifecycle Emissions Balance	Material Issue?	Market Participant	Yes	Considering lifecycle emissions seems like a point critical to the central logic for alternative fuels - if these alternative fuels do not offer a lower lifecycle emissions balance. Not to mention that if it is later discovered (through lifecycle emissions analysis) that biofuels do not achieve the stated objective of reducing emissions than the credibility of the space will be greatly and potentially irreparably, damaged
Biofuels	Lifecycle Emissions Balance	Material Issue?	Market Participant	Yes	Regulatory risk. Biofuels only make sense and will only receive regulatory preference if lifecycle emissions are lower than traditional fossil fuels.
Biofuels	Lifecycle Emissions Balance	Material Issue?	Market Participant	Yes	Producers may face stricter emissions regulations from government so managing emissions will be important. Reducing emissions during the production process may also reduce costs and increase competitive advantage.
Biofuels	Lifecycle Emissions Balance	Material Issue?	Public Interest & Intermediaries	Maybe	My general concern is not with the LEB calculation itself but with the fact that the calculation is tied to a gasoline fuel base-line - such a baseline may provide an erroneous comparative calculation and slow innovation to substantially advance lowering GHG impacts. This is an inadvertent impact of many code requirements - the code establishes the minimum standard and businesses gear their production efforts to meeting the minimum versus raising the bar and moving the industry to its true potential. This not only slows efforts to address ESG issues but it leaves companies vulnerable to other enterprises that are pursuing supra-advanced products.
Biofuels	Lifecycle Emissions Balance	Material Issue?	Public Interest & Intermediaries	No	This is, from my understanding, a political argument against biofuels. Lifecycle Emissions will change as technologies evolve. In a world dominated by fossil fuels discussion about Emissions of biofuels in its lifecycle is not material.
Biofuels	Lifecycle Emissions Balance	Material Issue?	Public Interest & Intermediaries	Yes	Lifecycle emissions of biofuels is not fully understood. There is good understanding of biofuels sourced from canola in Canada, however fuel sourced from corn, palm oil etc is not as well understood.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Lifecycle Emissions Balance	Material Issue?	Public Interest & Intermediaries	Yes	<p>As described in the brief, lifecycle GHG emissions is a key reason to justify continued public support for biofuels. Biofuels must be able to demonstrate significant GHG savings compared to fossil fuels, in order to continue to claim climate change benefits as a reason for public policy support. Despite that, the lifecycle GHG benefits of biofuels have come into question, in particular due to the indirect GHG emissions resulting from introducing this new market opportunity for agricultural products, leading to increased deforestation rates, especially in tropical regions with high carbon stock lands. It should be noted that the Roundtable on Sustainable Biomaterials (RSB) requires that all biofuel operations demonstrate lifecycle GHG savings of at least 50%, and includes a globally recognized methodology.</p>





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Lifecycle Emissions Balance	Material Issue?	Public Interest & Intermediaries	Yes	<p>The biomass industry portrays itself as having “low” emissions, “zero emissions,” or as being “carbon neutral.” In fact, there is an abundance of research explaining the mechanics behind the obvious – that it takes minutes to burn wood and put the carbon in the atmosphere, and decades to re-sequester an equivalent amount of carbon. Similarly, as the biofuels industry increasingly competes for the same feedstocks that are currently being burned in biomass power plants, the issues of more complex lifecycle accounting will have to be resolved. It is our understanding that the EPA has never conducted lifecycle carbon accounting for wood used as feedstock under the RFS2. This must be corrected.</p> <p>Of our work, the best resource for explaining how and why wood-burning power plants emit more CO2 than coal plants, and why these emissions persist, contributing to global warming for decades, is in our report to the FTC, which we referenced in the first question. That report is at <a href="http://www.pfpi.net/wp-content/uploads/2014/07/PFPI-report-to-FTC-on-biomass-power-greenwashing.pdf">http://www.pfpi.net/wp-content/uploads/2014/07/PFPI-report-to-FTC-on-biomass-power-greenwashing.pdf</a></p> <p>Much of the material in this report is relevant to the biofuels industry.</p>
Biofuels	Lifecycle Emissions Balance	Material Issue?	Public Interest & Intermediaries	Yes	<p>Given that this is a very policy-driven market, it is important that companies disclose the lifecycle emissions because it's important that biofuels have less of a GHG impact than traditional fossil fuels. There are a number of incentives that the companies may not meet if they don't meet certain GHG emissions standards.</p>
Biofuels	Lifecycle Emissions Balance	Material Issue?	Public Interest & Intermediaries	Yes	<p>The EU has been focusing on Indirect land use change for a while. There will be similar scrutiny in the US.</p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Metric comment	Add Issue	Corporations	Conversion efficiencies	standardized measurements such as conversion yields from feedstock to ethanol (denatured or undenatured), etc. Provides investors data to compare investment alternatives (i.e. which company is more efficient).
Biofuels	Metric comment	Add Issue	Corporations	yield : Kg biofuel/kg dry feedstock	This is the underlying driver behind most of the other topics - lets see it front and center, not hidden in the reporting
Biofuels	Metric comment	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	Overall, this is a high quality process. The research brief was well researched and well written, and the metrics related to the disclosure topics in this questionnaire were well conceived. I would simply suggest that many of these topics are already integrated into the existing RSB certification program. I was pleased to see certification listed as a disclosure topic, and would stress that it can to some extent serve as a proxy indicator for other disclosure topics addressed herein.
Biofuels	New Angle	Add Issue	Corporations	Recycling  [PRODUCT FORMULATION & IMPACT ON FOOD MARKETS]	Following the "waste hierarchy," it would be helpful to disclose the proportion of biofuel derived from post-consumer recycled waste. Without this information, beneficial practices like curbside recycling of plastics and composting will not be featured. This is another means to deal with the issue of discouraging food used for fuel.
Biofuels	New Angle	Add Issue	Corporations	Use of antibiotics  [PRODUCT FORMULATION & IMPACT ON FOOD MARKETS]	not well studied impact of antibiotic use in the ferm process for most biofuels.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	New Angle	Add Issue	Public Interest & Intermediaries	Governance and transparency  [POLITICAL SPENDING & GOVERNMENT SUPPORT]	The industry receives Governmental support in many countries. The disclosure on capital composition, PEPs and corruption measures is key.
Biofuels	New Angle	Add Issue	Public Interest & Intermediaries	Nonrenewable Resource (NRR) Consumption  [LIFECYCLE EMISSIONS BALANCE]	If one of the primary goals of increased consumption of biofuels is to limit the environmental consequences of fossil fuel use, then does it make sense to report on NRR depletion (or fossil fuel use) in regards their production? For example, if company A uses two gallons of petroleum to make one gallon of ethanol and company B uses a renewable energy source to fuel production (i.e wind or solar), does this information serve as material for the eco-conscious investor? The life cycle GHGs may not tell the whole story. Particularly if company B is less efficient in other aspects of production (e.g. transportation), potentially emitting more GHGs.  I don't have a source for this. I mention it because one of our more recent clients requested impacts be reported in terms of NRR use instead of GWP using a similar rationale.
Biofuels	New Angle	Add Issue	Public Interest & Intermediaries	Transportation impacts to serve distant markets  [LIFECYCLE EMISSIONS BALANCE]	Perhaps an under addressed area, the transportation impacts of production to pump should be a consideration. There are significant impacts here as well as exposure to locally sourced production.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	New Angle	Other Comment	Corporations	D.N.A. - Other Comment  [PRODUCT FORMULATION & IMPACT ON FOOD MARKETS]	The brief is well done, but should be supplemented with some topics mentioned earlier in this response -- the distinction between pre- and post-consumer feedstocks, the need to address recycling vs. fuels consumption where composting and traditional recycling are superior on a life-cycle basis to biofuels production, the importance of community engagement for all operations with potential for community impacts.
Biofuels	New Issue	Add Issue	Corporations	Community engagement  [LAND USE AND COMMUNITY RELATIONS]	Because biofuels production involves physical plants and community impact, this topic is as pertinent as it is for general manufacturing.
Biofuels	New Issue	Add Issue	Corporations	Life cycle of environmental capital  [LAND USE AND COMMUNITY RELATIONS]	think water is included in the study, and livestock should as well as this is part of the study , perhaps in here Land use should be there too
Biofuels	New Issue	Add Issue	Corporations	Product Performance  [PRODUCT EFFICIENCY]	Product performance describes how a biofuel performs in vehicle, ie miles per gallon.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	New Issue	Add Issue	Public Interest & Intermediaries	Local land rights  [LAND USE AND COMMUNITY RELATIONS]	Indigenous people with traditional claims to land are particularly disadvantaged by oil palm expansion, as formal recognition of their claims is limited.
Biofuels	New Issue	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment  [LAND USE AND COMMUNITY RELATIONS]	I feel as though community relations & rights of indigenous peoples was not adequately represented in the metrics.
Biofuels	No action needed	Comment on Brief	Public Interest & Intermediaries	D.N.A. - Comment on Brief	The brief was good - I would have done my own research regardless of how good the brief was though.
Biofuels	No action needed	Inaccuracy	Public Interest & Intermediaries	D.N.A. - Inaccuracy	The research brief was 95% accurate. There were just a few minor inaccuracies and updates needed. They will be provided in separate comments.
Biofuels	No action needed	Other Comment	Corporations	D.N.A. - Other Comment	This survey closely reflects due diligence done through acquisitions so I feel it is reflective of the standards process.
Biofuels	Political Spending & Government Support	Material Issue?	Corporations	Maybe	Investors would want to know where money is being spent and ensuring no PAC rules have been violated
Biofuels	Political Spending & Government Support	Material Issue?	Corporations	Maybe	Unless the reporting is normalized by proportion of the business attributable to biofuels production, the data will not be comparable.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Political Spending & Government Support	Material Issue?	Corporations	Maybe	Political spending and government support are often on an industry wide basis rather than company specific.
Biofuels	Political Spending & Government Support	Material Issue?	Corporations	Maybe	Makes sense only if it required across all industries. selective reporting provides no perspective. Questions also arise as to how an investor or company could measure and disclose effectiveness.
Biofuels	Political Spending & Government Support	Material Issue?	Corporations	No	not a sustainable metrics - its politics
Biofuels	Political Spending & Government Support	Material Issue?	Corporations	Yes	provided my inputs in the previous comments
Biofuels	Political Spending & Government Support	Material Issue?	Market Participant	Maybe	This is relevant, but its regionally specific to the US, although you could argue that the vast majority of companies involved are based in the US. But something to bear in mind, this is not necessarily material to all companies operating globally.
Biofuels	Political Spending & Government Support	Material Issue?	Market Participant	No	Investors rarely if ever look at this information when assessing the value of stocks in any industry. No reason why this industry should be different.
Biofuels	Political Spending & Government Support	Material Issue?	Market Participant	No	This topic has the least environmental impact. It may take away funds that could be used for R&D or other processes that could increase efficiency, but is much less impactful than operations and input selections.
Biofuels	Political Spending & Government Support	Material Issue?	Market Participant	Yes	Except for corn ethanol in the US, no biofuel demand would exist organically without government support. This is especially true in a low oil price environment.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Political Spending & Government Support	Material Issue?	Market Participant	Yes	Disclosures of interest groups, lobbying efforts, subsidies etc seem particular relevant for companies operating in this space.
Biofuels	Political Spending & Government Support	Material Issue?	Public Interest & Intermediaries	Maybe	There is a tremendous drive by NGOs and consumer action groups to affect corporate policy and practices. Many companies are adjusting policies and strategies as a result of consumer influences. Monsanto is a great example of a company that has spent millions to influence government policy and administrative benefits, however their profits have suffered as a result of global government policies/regulations, consumer backlash, and stock holder outcry. In global markets, the influence here is not as material as previously experienced.
Biofuels	Political Spending & Government Support	Material Issue?	Public Interest & Intermediaries	Maybe	This could become a black hole of data gathering. I think if the data collection is kept to the metrics outlined (amt. of biofuel tax credit received, amt. of political campaign spending, and 5 largest political...) then that's ok.
Biofuels	Political Spending & Government Support	Material Issue?	Public Interest & Intermediaries	Maybe	My general concern with spending in this area is the risk that monetary expenditure is made to further entrench existing positions in the market versus pressing the envelope toward supra-advanced biofuel production. To the extent these funds are spent to maintain status quo in the industry or slow the progress to elevate standards, spending does not translate to long-term value creation for the company.
Biofuels	Political Spending & Government Support	Material Issue?	Public Interest & Intermediaries	Yes	Government support for biofuels is material in the sense that biofuels are a marginally profitable venture without government subsidies. Especially with recent lower petroleum prices, a successful biofuel industry would not be possible without government support policies at the local, state and federal levels.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Political Spending & Government Support	Material Issue?	Public Interest & Intermediaries	Yes	The bioenergy industry is heavily dependent on government subsidies, as tax credits, loans, and grants. Biomass power for electricity production is also dependent on state-level ratepayer-funded renewable energy subsidies. The extent of this dependence really cannot be overstated. Companies should disclose this to investors, because government support and the availability of subsidies and tax credits waxes and wanes.
Biofuels	Political Spending & Government Support	Material Issue?	Public Interest & Intermediaries	Yes	The industry is heavily reliant on government subsidy. We saw in Germany what happened when subsidies were removed- for many biofuel producers it became uneconomic to produce.
Biofuels	Product Formulation & Impact on Food Markets	Add Issue	Market Participant	Resource efficiency	Second and third generation biofuels have potential to divert cellulosic feedstock or otherwise unusable waste materials, as well as create fuel from non-edible crops. This isn't a fully formed idea, but I think the list of disclosure topics doesn't provide for the potential positive impact of resource efficiency, waste diversion - two of the most exciting concepts within biofuels.
Biofuels	Product Formulation & Impact on Food Markets	Inaccuracy	Corporations	D.N.A. - Inaccuracy  [PRODUCT FORMULATION & IMPACT ON FOOD MARKETS]	Understated importance of DDGS to ethanol producers. Impact of biofuel production on food (corn) prices not well stated.
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Corporations	Maybe	whats more important here or at lease equally important is the yield of biofuels/kg of feedstock. Significant opportunity remains in this metric and it just not a matter of using less food grade feedstock - but using it more efficiently.





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Corporations	Maybe	As an industry it may be important but at the company level, it is difficult to determine the company's singular impact on food markets. Where plants are located in destination markets, the corn feedstock is delivered largely through unit trains which can source from multiple locations of the Midwest. The price of the feedstock is the largest determinant and drives the decision process of source.
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Corporations	Yes	with the revision and newly propogated standards being issued under the food safety modernization act, animal feed quality and prevention of contamination will be much more highly regulated in the future. The impact of contamination from bird droppings, or rodents, and other factors on open storage of DDG and WDG on cattle and livestock is being scrutinized. If dditionl control are deemed required, HAACPs are needed, or upgrades to the ethanol plant to meed food quality standards become required, it would be costly and difficult to comply.
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Corporations	Yes	Evaluations should distinguish pre and post-consumer feedstock (crop vs. waste).
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Corporations	Yes	Not clear to me what is meant by "product formulation." I interpreted to mean the type of feedstock, ie food versus non-food.
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Market Participant	Yes	Regulatory schemes like the RFS2 and LCFs are linked to LCA analysis of biofuels
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Market Participant	Yes	This is an area critical for increased understanding. I strongly believe that biofuels should come from waste streams rather than divert resources from food markets.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Market Participant	Yes	The rise of the global middle class combined with population growth will lead to rising demand for food crops. Feedstock for biofuels will compete directly with this rising demand thus putting at risk future growth of available feedstocks.
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Market Participant	Yes	The type of materials used to produce biofuels (corn, soy, sugar cane, algae, rape seed, etc.) can have significant impacts on producers. The use of food products stands to increase food costs and possibly lead to land use changes.
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Public Interest & Intermediaries	Maybe	Just depends on the type of company; to require this of all biofuels companies may be unnecessary (i.e. advanced non-corn starch biofuels).
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Public Interest & Intermediaries	No	food v. fuel is very difficult to link to biofuels, as it is heavily tied to very individual factors around location, feedstock, land use, etc...
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Public Interest & Intermediaries	No	Impact on Food Markets will be regulated by market. I do not see risks in biofuels competing with food stocks. Global food stocks are enough for global population, the bottleneck is logistics.
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Public Interest & Intermediaries	Yes	The balance between cash crops vs food crops has always been an issue. In my experience the care of the land in the production of cash crops is far inferior to that undertaken for food crops (my personal experience in Ghana and PNG).



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Public Interest & Intermediaries	Yes	This is a material topic, however, only insofar as it impacts on the industry as a whole through public support for the sector. The impact of an individual facility or company on food markets is negligible, however government support for an industry that can in aggregate compete with food markets for inputs creates significant risk for first generation biofuels. The ability to address this issue by an individual company is limited. The RSB standard address food security issues, however they only apply to companies directly operating in food insecure regions, as defined by the International Food and Policy Research Institute (IFPRI). Furthermore, RSB is developing a "low-iLUC" protocol to identify specific biofuel pathways that are at low risk of contributing to aggregate demand for agricultural products in the food markets.
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Public Interest & Intermediaries	Yes	Many companies are focusing on chemicals of concern as identified in various regulatory lists, however these lists do not always identify gap between current restricted substance lists (RSLs) and chemicals showing concern for human health effects. For example, there is a significant number of chemicals showing evidence of concern for developmental-reproductive toxicity that are not yet listed as restricted on leading authoritative lists of developmental-reproductive toxins. As companies work to develop product formulations, those that begin to think ahead of the curve will be better positioned in the market especially as NGOs drive smarter consumerism.
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Public Interest & Intermediaries	Yes	Tim Searchinger's latest report is highly relevant. It's at <a href="http://www.wri.org/publication/avoiding-bioenergy-competition-food-crops-and-land">http://www.wri.org/publication/avoiding-bioenergy-competition-food-crops-and-land</a>
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Public Interest & Intermediaries	Yes	<a href="http://www.ecofys.com/files/files/ecofys-2013-biofuels-and-food-security.pdf">http://www.ecofys.com/files/files/ecofys-2013-biofuels-and-food-security.pdf</a>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Public Interest & Intermediaries	Yes	<a href="http://www.ecofys.com/files/files/ecofys-2013-biofuels-and-food-security.pdf">http://www.ecofys.com/files/files/ecofys-2013-biofuels-and-food-security.pdf</a>
Biofuels	Product Formulation & Impact on Food Markets	Material Issue?	Public Interest & Intermediaries	Yes	<p>As the industry shifts from food feedstock based production to green waste/high cellulose biofuel production, the location and investment/value in food based ethanol facilities may be significantly impacted. Municipal Solid Waste/green waste based production facilities can be located close to major metropolitan areas and land-fills, providing local resources and lowering overall green house gas impacts related to transportation.</p> <p>This may make the need for certain facilities located near food feedstock sources unnecessary or obsolete - effecting local economies.</p>
Biofuels	Regulations	Add Issue	Market Participant	List of regulations to which the company must comply.	Gives investors a concise list of the relevant regulations so they can assess independently the risk that any one of them may change over time and have an adverse affect on the company.
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Corporations	Maybe	The FSMA - Food Safety Modernization Act requirements for ethanol plants and our distillers grain products are still in draft and poorly defined by the government. It is hard to predict the outcome at this time and potential impact to the industry.
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Corporations	Maybe	while very important - I feel the responsibility belongs to the feedstock provider and yes I do believe presuure needs to be put on the suppliers by the feedstock buyers, but the full responsibility does not sit the buyers.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Corporations	No	by having a life cycle this should already be considered
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Corporations	Yes	It would be useful to track both impacts on ecology and efforts by the organization to enhance ecology (e.g., habitat preservation projects)
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Corporations	Yes	In the emerging markets like India.. Land is a rare commodity and food is a basic requirement which has to be considered while embarking on a biofuel production strategy
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Market Participant	Maybe	The technology for biofuels is still advancing and there may be breakthroughs that reduce the need for food stock items. Raw material may also become available from other producers and biofuels may also be produced in new areas, resulting in greater supplies.
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Market Participant	Yes	As mentioned in the issue of regulatory schemes tied to the LCA of biofuels, the issue of Sourcing & Ecological Impacts of Feedstock Production.  Most next-generation biofuels companies place emphasis on sustainable feedstock sourcing that doesn't impact food supply.
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Market Participant	Yes	Similar to my point on food crops, I feel that biofuels should come from a waste stream rather than divert from food production.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Market Participant	Yes	Feedstock is critical to the production of biofuels and the highest cost of production. Availability at a reasonable cost are very material to the success of the company.
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Public Interest & Intermediaries	Yes	As I mentioned previously, biofuel from canola in Canada is widely understood in terms of emissions and other environmental factors. Biofuels that contain material from palm oil production in SE Asia are not well understood. Palm oil production in parts of the world is not managed in an environmentally and socially responsible manner. I would want to understand the source of any biofuel I was using.
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Public Interest & Intermediaries	Yes	Most of the controversial sustainability issues associated with biofuels occur at the feedstock production level. Due to increased aggregate demand for biofuels, there is a potential for agricultural expansion onto new lands. Furthermore, increased demand for commodity feedstocks such as corn can put pressure on farmers to increase yields through over use of chemical fertilizers, leading to increased runoff.
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Public Interest & Intermediaries	Yes	In this industry the link to sustainable sourcing is critical and will tie directly farming practices, water use, fair trade practices, etc. Also vicinity of feedstock to production facilities is an important factor. Small scale production vs. large scale production may compete as companies work to establish production capabilities near feedstock sources. Egypt has recently attempted to develop small scale production in this manner. As this technology develops, it will be something to watch as an indicator to investment opportunity.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Public Interest & Intermediaries	Yes	<p>Impacts from feedstock sourcing and ecological impacts are intertwined with the impacts described previously – the effects of biomass energy and biofuels on air emissions, water, and in particular, lifecycle carbon emissions. Given the relentless promotion of bioenergy as clean and environmentally sustainable, investors deserve to hear about actual impacts and the risks to the climate and ecosystems, as well as risks posed to their investments. Forests are particularly threatened by bioenergy development. There are three main sectors of the bioenergy industry that rely on cutting forests: the domestic biopower industry, which chips and burns forest wood for fuel to generate electricity in power plants; the pellet industry, which manufactures dried wood pellets out of forest wood, then ships these pellets to the UK and Europe to be burned for electricity generation there; and the biofuels industry, that is increasingly turning to forest wood as feedstock for biofuels.</p> <p>Here are the locations of three representative facilities. These facilities each consume hundreds of thousands of tons of forest wood each year. Copying and pasting the digital coordinates for each facility into Google Earth or Bing Maps will “fly” the viewer to the location where they can view the actual facility and the piles of wood used as fuel and feedstock.</p> <p>Plant Lat, Long Wood per year</p> <p>Biopower: 50 MW Wheelabrator plant, Shasta, CA 40.427766, -122.277342 625,000 tons</p> <p>Pellets: Georgia Biomass, Waycross, GA 31.263763, -82.408795 1,700,000 tons</p> <p>Biofuels: Kior plant, Columbus, MS 33.471163, -88.436014 360,000 tons</p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Public Interest & Intermediaries	Yes	Can't the water stress metric go into the water management issue? I am inclined to say that there should be more guidance on what constitutes an "ecological risk" in this topic area...perhaps use the Millennium Ecosystem Assessment framework: <a href="http://millenniumassessment.org/en/Framework.html">http://millenniumassessment.org/en/Framework.html</a>
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Public Interest & Intermediaries	Yes	Feedstock pricing and distribution volatility could cause similar disruptions to the biofuel industry as we have seen happening with the oil and gas sector.
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Public Interest & Intermediaries	Yes	<a href="http://www.cifor.org/publications/pdf_files/WPapers/WP68Pacheco.pdf">http://www.cifor.org/publications/pdf_files/WPapers/WP68Pacheco.pdf</a>
Biofuels	Sourcing & Environmental Impacts of Feedstock Production	Material Issue?	Public Interest & Intermediaries	Yes	The limitation of land, water and food supply is a significant and material consideration. Particularly with the current drought conditions effecting the West. With the stress on food production in drought prone areas and the conversion of mid-west farmland to corn from other crop production, the industry may be confronted with public policy considerations related to food needs vs use of land for feedstock production.  There is also long term concern related to soil health - repetitive planting without rotation generally lead to poor soils conditions and lower production yields. Augmenting soils through fertilization creates other environmental and health concerns.
Biofuels	Water Management	Material Issue?	Corporations	Maybe	There would not be any significant difference in water consumption for producing biofuel vis-à-vis conventional fuel.
Biofuels	Water Management	Material Issue?	Corporations	Maybe	The cost of management is already captured in COGS. Calling out water management would be relevant to the extent it is a material cost in the production process or in complying with regulations.





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Water Management	Material Issue?	Corporations	Yes	Waste water management is critical in ethanol production and vinasse, can also be a source of energy
Biofuels	Water Management	Material Issue?	Corporations	Yes	<p>Violations of the Clean Water Act or the NPDES or Storm Water permits can have financial, civil and criminal penalties associated with them. Water discharge standards can be difficult to meet and grow increasingly difficult over time. Being unaware of your water discharge quality and understanding how to manage it can make operational success difficult. In addition, water pollution is easy to detect by neighbors and wildlife through downstream effect.</p> <p><a href="http://www2.epa.gov/enforcement/water-enforcement">http://www2.epa.gov/enforcement/water-enforcement</a></p> <p><a href="http://www2.epa.gov/enforcement/water-enforcement">http://www2.epa.gov/enforcement/water-enforcement</a></p> <p><a href="http://www.waterboards.ca.gov/about_us/performance_report_1011/enforce/31161_npdes_ww_violations.shtml">http://www.waterboards.ca.gov/about_us/performance_report_1011/enforce/31161_npdes_ww_violations.shtml</a></p>
Biofuels	Water Management	Material Issue?	Corporations	Yes	Water management should be normalized to reflect the proportion of operations involved in biofuels production.
Biofuels	Water Management	Material Issue?	Corporations	Yes	limited resource and technology exists to manage this appropriate. In addition innovation is needed in this area to provide improved microbes to handle recycled streams. One significant item that also needs to be tracked in the biofuels manufacturing process is antibiotic use in the process, Including discharge into the environment.
Biofuels	Water Management	Material Issue?	Market Participant	Yes	Regulatory schemes like the RFS2 and LCFs are linked to LCA analysis of biofuels
Biofuels	Water Management	Material Issue?	Market Participant	Yes	Water management is an area that I feel should be more closely monitored and reported in. From an impact investing perspective, it is difficult to collect data on water use. To the extent that this provides a basis for comparison, it would be helpful. I also think that agriculture needs to be more transparent in terms of the sector's use of water, given that it is one of the nation's largest consumers of water.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Water Management	Material Issue?	Market Participant	Yes	Climate change increasing risk of water becoming scarcer resource thus threatening feedstock yields which could lead to declining output production.
Biofuels	Water Management	Material Issue?	Market Participant	Yes	Water availability is a major need for operations in all aspects. This includes production of materials and running the refineries. Water availability may also determine where plants can be located and residents and governments may raise concerns about water use and contamination.
Biofuels	Water Management	Material Issue?	Public Interest & Intermediaries	Yes	Many biofuel plants have significant water intake and discharge requirements, as do the feedstocks needed for those plants. Water management can be directly impacted by a company or facility and in areas with drought, can materially impact the ability of a company to source and maintain feedstock
Biofuels	Water Management	Material Issue?	Public Interest & Intermediaries	Yes	Production of Biofuels is an enormous consumer of water. In a time of decreasing access to quality water I believe this to be a material issue.  <a href="http://www.iwmi.cgiar.org/Publications/Water_Policy_Briefs/PDF/WPB30.pdf">http://www.iwmi.cgiar.org/Publications/Water_Policy_Briefs/PDF/WPB30.pdf</a>  also <a href="http://biofuel.org.uk/water.html">http://biofuel.org.uk/water.html</a>
Biofuels	Water Management	Material Issue?	Public Interest & Intermediaries	Yes	As mentioned in the briefing, water use is a material topic for biofuel use, as most biofuel facilities use significant volumes of water, and their discharge can significantly impact on local water treatment facilities. Wastewater discharge violations are not uncommon. It should be noted that the Roundtable on Sustainable Biomaterials (RSB) requires that all commercial facilities have an active Water Management Plan which includes all relevant use and discharge permits, indicates the water usage by the facility, and establishes protocols for lawful discharge in accordance with permitted allowances.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Biofuels	Water Management	Material Issue?	Public Interest & Intermediaries	Yes	Again, the ubiquitous marketing of biomass power and biofuels as green and clean hides their prodigious water use. Biomass power plants are no different from coal plants; they require water for cooling, so that typical water use by a 50 MW wood-burning plant is close to 1 million gallons per day. Water use by the ethanol industry is legendary, as highlighted in the SSB brief.
Biofuels	Water Management	Material Issue?	Public Interest & Intermediaries	Yes	In areas with extremely high water stress, or water that requires significant treatment, it may be difficult to even refine the fuel. There also may be social license to operate issues if water scarcity/contamination issues occur.
Biofuels	Water Management	Material Issue?	Public Interest & Intermediaries	Yes	<a href="http://www.iwmi.cgiar.org/Publications/Water_Policy_Briefs/PDF/WPB30.pdf">http://www.iwmi.cgiar.org/Publications/Water_Policy_Briefs/PDF/WPB30.pdf</a>
Biofuels	Water Management	Material Issue?	Public Interest & Intermediaries	Yes	<p>W r t water, the consideration needs to be given to the use of non-potable water supplies vs. potable water through the implementation of emerging on-site grey water and black water reclaimed water systems. The quality of the water from on-site waste water reuse systems can significantly reduce the environmental impacts of biofuel operations on local water supplies and related energy costs. Measurement of resource mitigation related to the resource inputs of the production process is as important a metric as production waste water reclamation.</p> <p>Secondly, the research into the high salt content of post production water should be elevated to assess long-term environmental risks. This is a area that is not fully understood w r t ground water and natural aquafer impacts.</p> <p>See link to information related to water and energy in California -</p> <p><a href="http://www.climatechange.ca.gov/climate_action_team/water.html">http://www.climatechange.ca.gov/climate_action_team/water.html</a></p>
Forestry & Paper	Air Quality	Material Issue?	Corporations	Maybe	All sites that have significant air emissions already report annual emissions. SASB would be redundant reporting



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Air Quality	Material Issue?	Corporations	Maybe	Air quality issues are fuel dependent (i.e. coal) or process dependent (i.e. integrated pulp mill with sulfur process)
Forestry & Paper	Air Quality	Material Issue?	Corporations	Maybe	The industry brief has a major and consistent flaw in the assumption that many companies are vertically integrated. By a large percentage this is the exception rather than the norm for the industry. Considering the significant difference between the forestry industry and the paper industry it is very difficult to identify any metric that is material to both industries. Air Quality is a good example. The materiality of air quality is significantly different for a paper company than a land management company. Also air quality is heavily regulated in the United States. Compliance to regulations is more material than a stand-alone air quality metric.
Forestry & Paper	Air Quality	Material Issue?	Corporations	Maybe	I do not have reservations with Air Quality being a DISCLOSURE topic, but I view disclosure and material as two separate items.  It is hard for me to say Air Quality is material per the Supreme Courts definition when investors do not ask about this topic.
Forestry & Paper	Air Quality	Material Issue?	Corporations	Maybe	Most air emissions come from the combustion of fuels. Air emissions are a lagging indicator and the result of energy use, fuel choices and air pollution control equipment. Air emissions are also highly regulated and emission limits can vary across the country (based on state differences and depending on if facilities are located in attainment zones or not) and therefore, do not lend themselves to being a comparable metric between companies. Air emissions by facility are already reported and publicly available in various government databases.
Forestry & Paper	Air Quality	Material Issue?	Corporations	Maybe	We believe that in a general sense many of the topics that we listed here as “Yes, but with reservations” may, in some - but not all – places and times - have an effect on our operations. However, in large part this depends on the final metrics employed. Further, although some of these measures could have a materially adverse effect on our operations in the future, we do not believe they do today, except to the extent we are already reporting on them in our securities filings.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Air Quality	Material Issue?	Corporations	No	Please see the AF&PA comments on the Containers and Packaging Standard
Forestry & Paper	Air Quality	Material Issue?	Corporations	Yes	See AF&PA's 2014 Sustainability report for data reflecting reduced industry air emissions.
Forestry & Paper	Air Quality	Material Issue?	Corporations	Yes	Must be in compliance with the Clean Air Act
Forestry & Paper	Air Quality	Material Issue?	Corporations	Yes	This area is already well regulated in North America, but new regulations can impose a material cost to companies.
Forestry & Paper	Air Quality	Material Issue?	Market Participant	Maybe	It could be relevant only in terms of licence to operate of the industry in one specific territory
Forestry & Paper	Air Quality	Material Issue?	Public Interest & Intermediaries	Maybe	There is an established regulatory system around emissions to air. Companies are already required to report to national pollutant release inventories. Companies will invest to reduce air emissions in accordance with regulations, thus it is already highly managed by companies. From a local community perspective (referring specifically to North America), forest communities are remote and value the economic opportunities provided by a forest company, and thus are not overly concerned with air emissions.
Forestry & Paper	Air Quality	Material Issue?	Public Interest & Intermediaries	Maybe	Air Quality is a backward looking indicator and is highly regulated. First, the air quality metric does not provide investors with any information about the future performance of the company with regards to air quality, it simply indicates how a company has done in the past. Second, air quality is highly regulated by the EPA and the amounts of any pollutant that a company discharges is dependent upon whether the company's manufacturing facility is located in an attainment or nonattainment area making it a metric that is easily comparable.
Forestry & Paper	Air Quality	Material Issue?	Public Interest & Intermediaries	Maybe	It's material, but already highly regulated by Federal and State regulations.
Forestry & Paper	Air Quality	Material Issue?	Public Interest & Intermediaries	Yes	Air quality has different materiality in different forest industries, from minimal in saw mills to important in pulp industry.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Air Quality	Material Issue?	Public Interest & Intermediaries	Yes	The manufacturing of forest products can include significant emissions and are highly regulated.
Forestry & Paper	Air Quality	Material Issue?	Public Interest & Intermediaries	Yes	Paper mills historically have been a source of air pollutants that have characterized their locations and decreased quality of life for those working and living nearby
Forestry & Paper	Air Quality	Material Issue?	Public Interest & Intermediaries	Yes	<p>I did not see mention of of the US EPA Cluster Rules that were released in 1998. This regulation greatly impacted the pulp and paper industry through combined air and water regulations. To my knowledge, this type of regulation was experimental at the time and only "experimented" on the pulp and paper industry.</p> <p><a href="http://water.epa.gov/scitech/wastetech/guide/pulppaper/cluster.cfm">http://water.epa.gov/scitech/wastetech/guide/pulppaper/cluster.cfm</a></p> <p>Air quality issues also affect social capital - although some air emissions are non-toxic or released below regulatory permit, some are quite odorous and displeasing to local populations communities. Mills can spend lots of money on public relations</p> <p><a href="https://www.dhs.wisconsin.gov/air/pulpodors.htm">https://www.dhs.wisconsin.gov/air/pulpodors.htm</a></p> <p><a href="http://www.uppermichiganssource.com/news/story.aspx?id=948101#.VPc2zfnF-ac">http://www.uppermichiganssource.com/news/story.aspx?id=948101#.VPc2zfnF-ac</a></p>
Forestry & Paper	Air Quality	Material Issue?	Public Interest & Intermediaries	Yes	Air Quality management is material for Forestry & paper as other pollutants and gases are relevant to the industry and health of the environment which provides trees for the raw material.
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Corporations	Maybe	Most of the discussion is either speculative or representative of non-industrial, unmanaged forests. Properly managed forests are less impacted by fire threats and infestations by pests are quickly addressed and managed.
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Corporations	Maybe	Again, the forest products industry is all in with maximizing the forest resource. Stresses on the forest resource are due to other industries and factors. Not material.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Corporations	Maybe	Large players in the paper industry may have some leverage on this aspect, but I doubt the very small players will have any. Also, this is more likely the pulp producers which have the connection and leverage on this aspect.
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Corporations	Maybe	This is an area that is very difficult to tackle, and it will be very difficult for stakeholders to evaluate whether the strategy is adequate or not. This is still an area where the science in development and the outcomes are still highly uncertain. Answers would be quite subjective.
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Corporations	Maybe	<p>The industry brief has a major and consistent flaw in the assumption that many companies are vertically integrated. By a large percentage this is the exception rather than the norm for the industry. Considering the significant difference between the forestry industry and the paper industry it is very difficult to identify any metric that is material to both industries. The vast majority of paper companies do not own land. While a company can have a purchasing policy it does not have ownership of forestland.</p> <p>Paper companies purchase fiber from industrial managed forests. A very large percentage of forest lands in the US is privately held by family foresters. These landowners in many instances are multi-generational and manage their land with future generations in mind. There is more standing timber in the US than ever before in large part to a highly regulated and well managed industry.</p>
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Corporations	Maybe	The beginning of the brief starts with the fundamental mistake that companies in this sector are integrated (meaning they own the land and the manufacturing facilities. This has not been the case for many years, as almost all the integrated companies sold their land years ago. Thus, this won't be material for most companies in the sector



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Corporations	Maybe	My reservation is not with Climate change adaptation as a disclosure topic but with the initial introduction to this topic in the research brief. The statement is made that "As a result, forests are likely to experience decreasing productivity over time." I disagree with this blanket statement as climate change will likely have varying impacts on forests depending on location; some may experience productivity loss while others may experience productivity gain. Therefore SASB needs to be careful how this is portrayed when discussing the potential for risk.
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Corporations	Maybe	Believe this is duplicative and would be covered in GHG emissions if SASB creates alignment with existing SEC regulations around GHG disclosure.
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Corporations	No	No quantitative measures.
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Corporations	No	There is very little known about climate adaptation of forest species at this time to be able to credibly opine on such a topic in a public report. Furthermore, most pulp and paper companies no longer own forestlands in the U.S. so this is more of a question for primary forest owners. [major forestry and paper company] primarily sources fiber from mixed natural forests that will be more resilient than monoculture plantations. Furthermore, this is another area that can be addressed through forest certification systems so it does not need to be addressed a second time through this metric.
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Corporations	No	With respect to climate change adaptation of forestlands, the physical risks of climate change - including changes in temperature and precipitation and the variability of disturbance events such as fire, flood, and hurricanes - could affect the forests we own and manage. However, at this time, we do not anticipate any disruptions to our planned operations. Further, the net impacts are indeterminate as there may be both positive and negative impacts to our operations. Therefore, we list this topic as "No, not material."





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Market Participant	Maybe	The objective is to operate sustainably with all living things. That by definition is inclusive of evaluating the health of the forest, including the need to change type of trees, for example, and its biological impact. Pursuing this objective detracts from the overall objective by focusing on a subset and there is no consensus as to what Climate Change Adaptation of Forestlands means.
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Market Participant	Maybe	N/A
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Market Participant	Yes	Since climate change is a relevant external risk, its effects can create a need for the industry to adapt to climate change changes in terms of water supply and extreme weather phenomena
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Public Interest & Intermediaries	Maybe	See comments on greenhouse gas emissions, as this seems to be another life cycle assessment question.
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Public Interest & Intermediaries	Maybe	This data moves too slowly to be of value year over year.
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Public Interest & Intermediaries	No	This is a macro, global issue - materiality at the facility or company level is limited.
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Public Interest & Intermediaries	Yes	The rate of depletion of forests is alarming but not widely recognized. Preservation of habitat and geographic integrity is imperative for future generations



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Climate Change Adaptation of Forestlands	Material Issue?	Public Interest & Intermediaries	Yes	Increased temperatures not only affect tree growth patterns, they also affect the life-spans of one of the most forest-destroying beetles in the West.  <a href="http://e360.yale.edu/feature/whats_killing_the_great_forests_of_the_american_west/2252/">http://e360.yale.edu/feature/whats_killing_the_great_forests_of_the_american_west/2252/</a>
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Add Issue	Market Participant	Other cultures nearby	It gives a picture of the land use situation and the impact on local communities
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Add Issue	Public Interest & Intermediaries	Communications and Engagement	The industry has a poor reputation for communicating with public audiences and engaging key stakeholders. This has historically put it at risk regulatory and voluntary policy efforts (LEED certification standards) that affects its marketshare.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Corporations	Maybe	It's highly country dependent, as far as we are concerned, this aspect is not material in the countries where we operate.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Corporations	Maybe	Percentage of forestland in or near indigenous land may be hard to define, especially in regions such as Canada. A discussion of the engagement processes and the due diligence practices would be a better indicator to allow people to appreciate risk.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Corporations	Maybe	Community relations are certainly important, but I am not sure about Indigenous Peoples as a topic in the U.S. is entirely material



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Corporations	Maybe	The industry brief has a major and consistent flaw in the assumption that many companies are vertically integrated. By a large percentage this is the exception rather than the norm for the industry. Considering the significant difference between the forestry industry and the paper industry it is very difficult to identify any metric that is material to both industries. Community Relations and Rights of Indigenous Peoples is a good example. The rights of indigenous peoples rarely impact an existing paper mill while a paper mill has a very large impact socially and economically to the communities where they operate.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Corporations	Maybe	Community Relations and indigenous peoples should be treated separately and not lumped together. These are both very qualitative metrics rather than quantitative which makes it very difficult to compare across companies. In addition, forest certification covered under forest management covers both community and indigenous people, so this metric is a bit duplicative.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Corporations	Maybe	We believe that in a general sense many of the topics that we listed here as "Yes, but with reservations" may, in some - but not all – places and times - have an effect on our operations. However, in large part this depends on the final metrics employed. Further, although some of these measures could have a materially adverse effect on our operations in the future, we do not believe they do today, except to the extent we are already reporting on them in our securities filings.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Corporations	Maybe	I have reservations, because I am not sure how you quantify or evaluate the effectiveness of such a program. The metric provided was "Discussion and Analysis". Also, you should define what "near" means when disclosing percentage of forestland in or near indigenous land.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Corporations	No	No quantitative measures.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Corporations	No	Most of the discussion in the Industry Brief related to the rights of Indigenous Peoples in non-U.S. based companies. While material in those instances, again, SASB's work relates to SEC reporting, which is limited to U.S. based companies. The instances of conflict or abuse with Indigenous Peoples or communities are rare in the U.S.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Corporations	No	Not a focus in the U.S.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Corporations	No	Like much of the anecdotal information in the industry brief, the examples in this category pertained primarily to other countries, not the U.S. I understand there are international companies in this sector, but I view the standard as primarily a U.S. standard.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Corporations	No	Believe most of this is covered by inquiries into Forestry Certification. For companies operating internationally, defining indigenous lands may be too difficult to ascertain as laws around land owners vary widely.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Market Participant	Maybe	Rights of indigenous people are simply not a material issue for pulp and paper manufacturers operating in the United States. Operators in certain other countries (New Zealand, Indonesia, etc.) are subject to causing far more harm to those populations and thus the importance of proper disclosure increases greatly.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Market Participant	No	Materiality must be viewed in the context of the surrounding considerations. Given the significance of the other considerations, and with a view that it does not make sense for all topics to be material, this is of a more specific concern than to population as a whole.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Market Participant	Yes	As already explained this is very relevant in case the activity is conducted in region of old forest and of natural interest. E.g. see the campaign against IKEA's deforestation in Karelia <a href="http://protecttheforest.se/de/pressmeddelanden/1878-pr-ikea-gets-fsc-certificate-suspended-and-withdraws-from-karelia">http://protecttheforest.se/de/pressmeddelanden/1878-pr-ikea-gets-fsc-certificate-suspended-and-withdraws-from-karelia</a>
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Market Participant	Yes	Australia has collaborated with Indigenous communities and forest industry stakeholders to develop a National Indigenous Forestry Strategy.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Public Interest & Intermediaries	Maybe	The standards being for companies listed in US stock exchanges, there are major European forestry companies without real issues with local communities or indigenous people. However, if that can be credited to those companies, the standard may have some relevance.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Public Interest & Intermediaries	Maybe	The significance of this topic varies greatly by country. It is largely a insignificant issue in the U.S. but a large issues in Canada, especially the Rights of Indigenous Peoples.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Public Interest & Intermediaries	Maybe	This topic is too general for one category. I would recommend breaking it down into two topics.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Public Interest & Intermediaries	Maybe	This metric is more applicable in the international context and not greatly material for companies that operate in the U.S. Additionally it is more relevant for forest owners as opposed to paper manufacturers.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Public Interest & Intermediaries	Maybe	Not a significant omission as defined here. Non-compliance and violations could be material.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Public Interest & Intermediaries	No	This is normally the role of government; having a business act in the place of a government cancels out the construction tension of a give and take process.
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Public Interest & Intermediaries	Yes	Companies in Canada have suffered significant business disruptions and have been prevented access to resources due to unsettled land disputes between Aboriginal communities and the federal government, so there is fair evidence for this issue being material. The tricky part is that companies were a third-party to a dispute they were not directly involved in. On the community side, the materiality of community relations varies depending on the economic situation of the community, the type of forest, if the company is a historical part of the community, if the company satisfies basic community needs related to hunting and recreation, use of logging roads by the community etc., efforts to minimize impacts on wildlife are made, sustainable forest management practices are applied, etc. than a community will generally remain satisfied.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Public Interest & Intermediaries	Yes	<p>Answered in air quality -</p> <p>Air quality issues also affect social capital - although some air emissions are non-toxic or released below regulatory permit, some are quite odorous and displeasing to local populations communities. Mills can spend lots of money on public relations and "hundreds of thousands" on odor control to ease the local stench.</p> <p><a href="https://www.dhs.wisconsin.gov/air/pulpodors.htm">https://www.dhs.wisconsin.gov/air/pulpodors.htm</a></p> <p><a href="http://www.uppermichiganssource.com/news/story.aspx?id=948101#.VPc2zfnF-ac">http://www.uppermichiganssource.com/news/story.aspx?id=948101#.VPc2zfnF-ac</a></p> <p><a href="http://www.tripadvisor.com/ShowUserReviews-g60814-d219403-r147428419-Westin_Savannah_Harbor_Golf_Resort_Spa-Savannah_Georgia.html">http://www.tripadvisor.com/ShowUserReviews-g60814-d219403-r147428419-Westin_Savannah_Harbor_Golf_Resort_Spa-Savannah_Georgia.html</a></p>
Forestry & Paper	Community Relations & Rights of Indigenous Peoples	Material Issue?	Public Interest & Intermediaries	Yes	A number of forests around the world are occupied by the traditional owners of the land. In the process of forced takeovers by governments and corporations, communities lose the land on which generations have lived. This is not just an issue of land ownership but also that of loss of identity and sustenance.
Forestry & Paper	Congratulations	Other Comment	Market Participant	D.N.A. - Other Comment	solid and accurate work - well done.
Forestry & Paper	Energy Management	Material Issue?	Corporations	Maybe	Risks would mostly already be covered by the Greenhouse gas topic. Data would be impossible to compare from one company to another and would likely not bring meaningful and material information



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Energy Management	Material Issue?	Corporations	Maybe	The industry brief has a major and consistent flaw in the assumption that many companies are vertically integrated. By a large percentage this is the exception rather than the norm for the industry. Considering the significant difference between the forestry industry and the paper industry it is very difficult to identify any metric that is material to both industries. Energy management is a good example. The materiality of energy management is significantly different for a paper company than a land management company. Paper companies with virgin content paper mills generate between 50 – 70% of their energy on site with renewable materials. A more meaningful metric would be purchased fuels.
Forestry & Paper	Energy Management	Material Issue?	Corporations	Maybe	Think Energy management should be rolled into GHG emissions. If want to break out renewable etc need to clarify how Biomass is perceived since its core to this industry
Forestry & Paper	Energy Management	Material Issue?	Corporations	Maybe	We believe that in a general sense many of the topics that we listed here as “Yes, but with reservations” may, in some - but not all – places and times - have an effect on our operations. However, in large part this depends on the final metrics employed. Further, although some of these measures could have a materially adverse effect on our operations in the future, we do not believe they do today, except to the extent we are already reporting on them in our securities filings.
Forestry & Paper	Energy Management	Material Issue?	Corporations	No	Impacts captured in financial reporting. Bad performers are already noted.
Forestry & Paper	Energy Management	Material Issue?	Corporations	Yes	See AF&PA's 2014 Sustainability report for data reflecting reduced industry energy use.
Forestry & Paper	Energy Management	Material Issue?	Corporations	Yes	Energy is a key cost to the industry
Forestry & Paper	Energy Management	Material Issue?	Corporations	Yes	The forest products industry uses a variety of fuels and combined heat and power for production purposes, the primary fuel is carbon neutral biomass. These benefits somewhat unique to our industry and should we highlighted as such.





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Energy Management	Material Issue?	Market Participant	Maybe	Energy management is always relevant in any process, however for the industry itself is water management more relevant
Forestry & Paper	Energy Management	Material Issue?	Public Interest & Intermediaries	Maybe	Energy management while an issue for this industry is not the biggest worry. Sustainable and ethical sourcing is a bigger and more relevant issue here.
Forestry & Paper	Energy Management	Material Issue?	Public Interest & Intermediaries	Maybe	According to SASB Industry Brief (P14-15), purchased electricity is 8% of the total use. According to SASB materiality definition, no significant alteration of information available to the investor.
Forestry & Paper	Energy Management	Material Issue?	Public Interest & Intermediaries	No	Energy has is a market-driven pricing structure
Forestry & Paper	Energy Management	Material Issue?	Public Interest & Intermediaries	Yes	Energy comprises up to 30% of the cost of making paper (see Resolute FP sustainability report 2010 or later). This is a significant cost and well-managed companies are intently focused on energy reduction and energy efficiency for this reason. Companies are also trying to be energy independent and reduce reliance on the grid (e.g., through the use of biomass).
Forestry & Paper	Energy Management	Material Issue?	Public Interest & Intermediaries	Yes	The energy consumption or production is greatly variable from major use in non-pulp paper production to large byproduct energy production in pulp mills.
Forestry & Paper	Energy Management	Material Issue?	Public Interest & Intermediaries	Yes	The sector is energy intensive and vulnerable to volatility in energy prices.
Forestry & Paper	Energy Management	Material Issue?	Public Interest & Intermediaries	Yes	waste management including recycling has been overlooked and needs to be added as a consideration for the future generations. Although forests are renewable they are time limited and not able to keep pace with use of resources in the world.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Energy Management	Material Issue?	Public Interest & Intermediaries	Yes	Energy management is directly related to costs; fuel prices have been volatile and mills in Canada and the US have been shutting down and restarting based on fuel costs.  <a href="http://www.naylornetwork.com/ppi-tissue/articles/index-v2.asp?aid=249303&amp;issueID=32328">http://www.naylornetwork.com/ppi-tissue/articles/index-v2.asp?aid=249303&amp;issueID=32328</a>  <a href="https://fisheri.com/images/features/Fisher%20Webinar%20Volatility%20of%20Natural%20Gas%20Prices.pdf">https://fisheri.com/images/features/Fisher%20Webinar%20Volatility%20of%20Natural%20Gas%20Prices.pdf</a>
Forestry & Paper	Energy Management	Material Issue?	Public Interest & Intermediaries	Yes	<a href="http://www.resource-solutions.org/pub_pdfs/RECs&amp;OffsetsQ&amp;A.pdf">http://www.resource-solutions.org/pub_pdfs/RECs&amp;OffsetsQ&amp;A.pdf</a>  Energy management is material as it relates to efficiency of production, pollution, GHGs and requires companies be distinguished based on their future sustainability with energy (renewables included).
Forestry & Paper	Fair Labor Practices	Material Issue?	Corporations	Maybe	The organization should first and foremost be in compliance with all pertinent safe labor laws. Often, this topic is too associated with the right to organize. Workers should also have the right to refuse to organize (right to work).
Forestry & Paper	Fair Labor Practices	Material Issue?	Corporations	Maybe	It's highly country dependent, as far as we are concerned, this aspect is not material in the countries where we operate.
Forestry & Paper	Fair Labor Practices	Material Issue?	Corporations	Maybe	In the U.S. we have very strong laws that govern these practices. I am not sure how this is entirely relevant for the discussion.
Forestry & Paper	Fair Labor Practices	Material Issue?	Corporations	Maybe	North American labor laws are broad in scope and very detailed. Companies that legally operate in North America comply with and have in place fair labor practices. Compliance to the laws related to fair labor practices is a more appropriate metric. There are many international positions related to labor practices such as the ILO Core Conventions and the ETI Base Code as well as many opinions. What is material however to a North American company is compliance to the law.
Forestry & Paper	Fair Labor Practices	Material Issue?	Corporations	Maybe	I don't think this is an issue for many US based companies. The materiality of this topic with vary with each entity.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Fair Labor Practices	Material Issue?	Corporations	Maybe	Fair labor practices are not an issue in the United States, but we can appreciate this metric being more relevant in other parts of the world that do not have robust labor laws as in the U.S.
Forestry & Paper	Fair Labor Practices	Material Issue?	Corporations	Maybe	RR0201-17 may become rather lengthy and difficult to compare if companies are all operating in different countries. Would think compliance to third party forestry certification covers much of this. If not what about compliance to SA 1000 or other international labor standard?
Forestry & Paper	Fair Labor Practices	Material Issue?	Corporations	Maybe	We believe that in a general sense many of the topics that we listed here as “Yes, but with reservations” may, in some - but not all – places and times - have an effect on our operations. However, in large part this depends on the final metrics employed. Further, although some of these measures could have a materially adverse effect on our operations in the future, we do not believe they do today, except to the extent we are already reporting on them in our securities filings.
Forestry & Paper	Fair Labor Practices	Material Issue?	Corporations	No	No quantitative measures.
Forestry & Paper	Fair Labor Practices	Material Issue?	Corporations	No	Again, much of the discussion in the Brief is either based on activities in developed countries (where labor abuses are rampant) or isolated incidents. The metric on policies and practices to ensure compliance is redundant with the metric requiring disclosure of fines and settlements.
Forestry & Paper	Fair Labor Practices	Material Issue?	Corporations	No	Most companies in the industry (especially in North America) are unionized, so this indicator would constitute a reporting burden that would be material to only a very small percentage of the sector.
Forestry & Paper	Fair Labor Practices	Material Issue?	Corporations	No	As explained above, this is more of an issue in other countries, not in the U.S.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Fair Labor Practices	Material Issue?	Market Participant	Maybe	Generally speaking, US pulp and paper manufacturers do not employ temporary, immigrant or other transient labor. Most labor is highly qualified with credentials (i.e. college or advanced degrees, or specific paper-making or related certifications). Further, the push by the Steelworkers union in US pulp and paper manufacturers has improved labor representation in ways that have diminished nearly all discussion about unfair labor practices. Yes, strikes can be debilitating to a pulp or paper manufacturer due to continuous manufacturing that is rarely interrupted.
Forestry & Paper	Fair Labor Practices	Material Issue?	Market Participant	Maybe	This does not seem to be specific to this industry - disclosure should be standard across all industries
Forestry & Paper	Fair Labor Practices	Material Issue?	Market Participant	Maybe	The link between fair labor practices and sustainability is indirect and do not share a common primary objective.
Forestry & Paper	Fair Labor Practices	Material Issue?	Market Participant	Yes	as above
Forestry & Paper	Fair Labor Practices	Material Issue?	Public Interest & Intermediaries	Maybe	I have less of an opinion on this. It is less of a question about "does the company employ fair labor practices?" and more about "does the company have good relationships with the unions?" - as they are not one in the same.
Forestry & Paper	Fair Labor Practices	Material Issue?	Public Interest & Intermediaries	Maybe	Even if the area is important, it does not have really any industry specific topics, so it seems questionable to have an industry standard.
Forestry & Paper	Fair Labor Practices	Material Issue?	Public Interest & Intermediaries	Maybe	there are sharp distinctions in the issues presented domestically and those out of the US. Again - a very broad topic that will result in variability in responses limiting comparisons
Forestry & Paper	Fair Labor Practices	Material Issue?	Public Interest & Intermediaries	Maybe	I don't feel that fair labor is an issue in pulp and a paper. Most paper mill workers make living salaries with guaranteed overtime due to the 24-hour nature of the operation. Some are still unionized. Perhaps more important for Forestry and/or companies with overseas operations.  <a href="http://www.bls.gov/oes/current/oes519196.htm#nat">http://www.bls.gov/oes/current/oes519196.htm#nat</a>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Fair Labor Practices	Material Issue?	Public Interest & Intermediaries	Maybe	This is a contractual matter between an operator and their employees, and a reporting matter on a very local basis with local government. Rolling up disclosure here also encourages outsourcing to keep metrics low for the compliant filer.
Forestry & Paper	Fair Labor Practices	Material Issue?	Public Interest & Intermediaries	No	Could possibly be relevant internationally but is not relevant to U.S. paper manufacturers.
Forestry & Paper	Fair Labor Practices	Material Issue?	Public Interest & Intermediaries	Yes	While description of a compliance policy may not be relevant information for the investor, reporting no. and frequency of non-compliance incidents will provide material information.
Forestry & Paper	Fair Labor Practices	Other Comment	Market Participant	D.N.A. - Other Comment	Fair labor practices and sustainability are two different things.
Forestry & Paper	Greenhouse Gas Emissions	Add Issue	Public Interest & Intermediaries	Renewable Energy Resources	Energy management implies efficiency and does not include biomass (a critical area of renewable energy for the industry) nor other resources that are common such as Solar PV, Wind and Hydro in managing energy, climate change impacts, air quality and greenhouse gas emissions.
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Corporations	Maybe	Clear differentiation must be made between GHG emissions from biogenic sources and those from fossil sources
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Corporations	Maybe	Utilizing the Supreme Court definition for material, GHG emission alone may not provide reliable information to a reasonable investor related to a company's economic or sustainable wellbeing. If a low emission low BTU fuel replaces a high emission high BTU fuel the emissions may be reduced but depending on the fuel, total fuel may be increased as well as total cost. If an investor is looking only at total fuel, GHG emissions may not be material.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Corporations	Maybe	Most greenhouse gas emissions come from the combustion of fuels, and to a smaller extent, forest management activities in areas where drain exceeds growth (this is not really an issue in the U.S. where forest stocks have been increasing over the past 50 years). GHG emissions are a lagging indicator and the result of energy use, fuel choices and forestry practices, and therefore if companies focus on energy and forest management, GHGs don't need to be included. It is important for companies to manage fewer of the right metrics, than numerous metrics of limited value. Furthermore, the majority of the pulp and paper industry energy comes from carbon neutral manufacturing biomass residuals.
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Corporations	Maybe	This should align with SEC existing mandates on GHG reporting. Include scope 1 & 2 as per EPA and CDP and provide directive on how this aligns with existing SEC guidelines.
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Corporations	Maybe	We believe that in a general sense many of the topics that we listed here as "Yes, but with reservations" may, in some - but not all – places and times - have an effect on our operations. However, in large part this depends on the final metrics employed. Further, although some of these measures could have a materially adverse effect on our operations in the future, we do not believe they do today, except to the extent we are already reporting on them in our securities filings.
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Corporations	Yes	See AF&PA's 2014 Sustainability report for data reflecting reduced industry GHG emissions.
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Corporations	Yes	Fuel is costly, impacting operating costs. Potential regulatory impact.
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Corporations	Yes	The forest products industry uses a variety of fuels for production purposes, the primary fuel is carbon neutral biomass. This is a benefit somewhat unique to our industry and should be highlighted as such.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Corporations	Yes	The forestry and paper industry uses large amounts of energy to produce its products. Much of this energy is biomass from sustainable forestry operations, providing significant carbon reducing benefits to the environment. However, the U.S. EPA is currently considering a framework to regulate biogenic carbon which could have widespread negative cost impacts to the industry depending on the final ruling. This is one example of the potential material impacts of GHG regulations on the industry. There is also increasing interest by industry customers in the carbon footprints of companies, indicating the material importance of this topic (e.g. increasing interest from customers in CDP forests and CDP supply chain).
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Market Participant	Yes	For the simple reason that over half of the educated population believes GHGs are directly responsible for climate change, and since pulp and paper manufacturers are among the largest emitters of GHGs, this issue is material.
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Market Participant	Yes	Forestry & Paper Industry on one side contribute to transform greenhouse gas emissions, but through its industrial process it generates greenhouse gas emissions and they are also a proxy for the industry efficiency
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Public Interest & Intermediaries	Maybe	The GHG emissions life cycle assessment has produced different models and academic research, which take into account the entire life cycle of wood, not only the immediate industry emissions. See for instance <a href="http://www.sciencedirect.com/science/article/pii/S0304380009005651">http://www.sciencedirect.com/science/article/pii/S0304380009005651</a> , <a href="http://pubs.acs.org/doi/abs/10.1021/es902673m">http://pubs.acs.org/doi/abs/10.1021/es902673m</a> , <a href="http://pubs.acs.org/doi/abs/10.1021/es1024004">http://pubs.acs.org/doi/abs/10.1021/es1024004</a>
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Public Interest & Intermediaries	Maybe	impact analysis and cost of measuring are still in developmental stages



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Public Interest & Intermediaries	Maybe	I agree with the need to publish GHGs from fossil fuel consumption. However most of the GHGs from black liquor (produced only during some pulping processes and never during papermaking) and biomass would be offset by its renewable nature. I would separate these two types of emissions - the one related to fossil fuel consumption will have a much bigger impact environmentally - though carbon cap regulations may not make the distinction.  <a href="https://greendiamond.com/issues-educational-links/carbon-neutrality-fact-sheet/">https://greendiamond.com/issues-educational-links/carbon-neutrality-fact-sheet/</a>
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Public Interest & Intermediaries	Maybe	The metric is premature since there is significant policy and regulatory uncertainty about the Carbon neutrality of renewable fuels and biomass residues.
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Public Interest & Intermediaries	Yes	Climate change is such a significant issue globally that GHGs are somewhat inherently material for all sectors. Regardless of this, GHG emissions are still highly material for forestry and paper companies. This sector impacts climate change by being both energy intensive but also through commercial forest management and timber harvesting. On the energy side, while companies increasingly use "renewable" energy in the form of biomass, biomass is not GHG-free and is not rapidly renewable the way wind or solar is. In short, as long as a sector is energy-intensive, unless they make a major shift to clean energy (not including biomass), GHG emissions should be material and reported on. On the other side, the impact on climate change through commercial forest management and timber harvesting, in my view, companies do not understand very well the impact they have on climate change through their forest management and through timber harvesting, as I do not see comprehensive reporting on this impact in annual sustainability reports.
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Public Interest & Intermediaries	Yes	The industry is energy intensive and so its dependence on energy inputs is very high making it vulnerable to GHG emissions control legislation. Also, source materials comes from managed forests where timber harvesting may be leading to a net emissions to atmosphere.





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Public Interest & Intermediaries	Yes	<p><a href="http://www.resource-solutions.org/pub_pdfs/Scope%20%20Accounting%20For%20U.S.%20RE.pdf">http://www.resource-solutions.org/pub_pdfs/Scope%20%20Accounting%20For%20U.S.%20RE.pdf</a></p> <p>GHG Emissions are a critical metric and materiality for the long and short term viability of the forestry industry. Without this included as material, investors will be missing a key factor in production, footprint and company sustainability.</p>
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Public Interest & Intermediaries	Yes	<p>Trees store carbon and the felling of trees releases emissions into the atmosphere. Companies in this space are contribution to this release of emissions, therefore it is essential that they discuss how they are managing this issue.</p> <p>In addition emissions are also released in manufacturing, processing and transport.</p> <p>Link:</p> <p><a href="http://www.greenpressinitiative.org/impacts/climateimpacts.htm">http://www.greenpressinitiative.org/impacts/climateimpacts.htm</a></p>
Forestry & Paper	Greenhouse Gas Emissions	Material Issue?	Public Interest & Intermediaries	Yes	Industry has capacity to provide carbon sequestration.
Forestry & Paper	Ind. Brief comment	Comment on Brief	Corporations	D.N.A. - Comment on Brief	The brief was overwhelmingly about negative risks. There was little discussion about the positive benefits created by the companies in this sector. Presumably those would be relevant to stakeholders, too.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Ind. Brief comment	Comment on Brief	Corporations	D.N.A. - Comment on Brief	We strongly urge SASB to significantly revise or rewrite the research brief. Among its flaws, the brief demonstrates a fundamental lack of understanding of the forest sector, mischaracterizes the structure of the industry, and employs outdated or irrelevant examples. If the brief is to inform investors or other SASB users, it should be re-written with input from sources knowledgeable about the industry. We would be willing to provide and discuss detailed notes on the research brief and to solicit the appropriate individuals or organizations who could contribute to a more accurate research brief.
Forestry & Paper	Ind. Brief comment	Inaccuracy	Corporations	D.N.A. - Inaccuracy	Lack of forestry knowledge led to speculation and application of urban myths vs. actual practices. As mentioned above, many 'evidence' discussions included outdated information or citations from non-developed countries that are not relevant to U.S. operations.
Forestry & Paper	Ind. Brief comment	Inaccuracy	Corporations	D.N.A. - Inaccuracy	There is still some concern around the standards that are being referenced that are not US centric.



Forestry & Paper	Ind. Brief comment	Inaccuracy	Corporations	D.N.A. - Inaccuracy	<p>On page 1, the statement “Many companies are vertically integrated, producing pulp and paper, wood products as well as harvesting forests.” is an inaccurate statement as most U.S. pulp and paper companies sold off their company-owned lands to TIMOs and REIT beginning about 15 to 20 years ago.</p> <p>Many references were made throughout the brief to foreign examples as evidence of materiality to a U.S. focused initiative (e.g., water risk examples on page 17)</p> <p>On page 13, as evidence for materiality for air quality, the National Emissions Inventory (NEI) was cited, and it has been our experience that the NEI database is riddled with errors and often does not match the data we publically reported.</p> <p>On page 15, the statement, “Forest products and paper manufacturing require substantial quantities of energy, which is sourced from the direct combustion of fossil fuels and the electrical grid” is not an accurate synopsis of the industry. According to the 2014 AF&amp;PA Sustainability Report, on average 66% of the energy used at AF&amp;PA member pulp and paper mills is generated from carbon neutral biomass and 59% of the electricity used by members is self-generated.</p> <p>On page 17, under the water management issue, the brief fails to mention we have many old mills in the industry, some of which have been operating for well over 100 years without significant water issues (e.g., [major forestry and paper company] Nekoosa, WI mill began operations on the Wisconsin River in 1883).</p> <p>Page 19, Total dissolved solids should be total suspended solids.</p> <p>Page 27, Community relations and rights of indigenous peoples should be treated separately as they can be different issues. We deal with local communities every day in every location, whereas indigenous peoples are only an issue in a few locations. It is usually the government’s</p>
------------------	--------------------	------------	--------------	---------------------	---



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
					responsibility to weigh in and settle land disputes and land use issues with indigenous issues, not that of the company that is leasing the land.
Forestry & Paper	Ind. Brief comment	Inaccuracy	Corporations	D.N.A. - Inaccuracy	<p>Page 23. Reference was made to the fact that intensive silviculture is a risk that can adversely affect the industry's reputation. Putting intensive silviculture in the same class as deforestation and illegal logging does a disservice to the forest industry and is not based in science. Intensive silviculture, when used appropriately, can increase yields and provide numerous benefits to society.</p> <p>Page 35. Reference was made to the fact that due to climate change, "...forests are likely to experience decreasing productivity over time". Research indicates that forests may experience either increased or decreased productivity as a result of climate change due to their location.</p>
Forestry & Paper	Ind. Brief comment	Inaccuracy	Corporations	D.N.A. - Inaccuracy	We strongly urge SASB to significantly revise or rewrite the research brief. Among its flaws, the brief demonstrates a fundamental lack of understanding of the forest sector, mischaracterizes the structure of the industry, and employs outdated or irrelevant examples. If the brief is to inform investors or other SASB users, it should be re-written with input from sources knowledgeable about the industry. We would be willing to provide and discuss detailed notes on the research brief and to solicit the appropriate individuals or organizations who could contribute to a more accurate research brief.
Forestry & Paper	Ind. Brief comment	Inaccuracy	Public Interest & Intermediaries	D.N.A. - Inaccuracy	At several points, the language describing the sector was less favorable than accurate to the sector.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Ind. Brief comment	Inaccuracy	Public Interest & Intermediaries	D.N.A. - Inaccuracy	<p>Black liquor is a by-product of the pulp process and has nothing to do with papermaking.</p> <p>The majority of pulp and paper producers are not longer vertically integrated to the forest.</p> <p>Pulping uses wood by-products from lumber and saw mills preferentially over whole-log.</p> <p>No mention was made of the EPA Cluster Rules, which I believe are still in effect.</p>
Forestry & Paper	Ind. Brief comment	Inaccuracy	Public Interest & Intermediaries	D.N.A. - Inaccuracy	Several company-specific quotes did not support the evidence towards materiality.
Forestry & Paper	Ind. Brief comment	Other Comment	Market Participant	D.N.A. - Other Comment	Very well written with excellent coverage and discussion of the impact areas for the sector. Fibria Cellulose is an example company, but I think Klabin is a strong peer of the company as it is 100% FSC certified.
Forestry & Paper	Ind. Brief comment	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	Although a number of the relevant metrics address risk and compliance concerns, the overall company approach or programs needs its own separate disclosure and analysis. This is a risky business and operates in many countries known for corrupt business practices. The issues could too easily be buried in random disclosures without adequate consideration for the overall risks and potential impacts to a company.
Forestry & Paper	Ind. Brief comment	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	The brief was incredibly thorough. The only thing I think could use more research is industry standards on how to engage indigenous communities, and how to screen non-certified wood products for environmental and social criteria. I noted these in my comments.
Forestry & Paper	Industry insights	Comment on Brief	Corporations	D.N.A. - Comment on Brief	More recent data pertaining to U.S. operations and practices. Of the 5 companies reviewed, only 2 were U.S. based companies.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Industry insights	Comment on Brief	Corporations	D.N.A. - Comment on Brief	The industry brief has a major and consistent flaw in the assumption that many companies are vertically integrated. By a large percentage this is the exception rather than the norm for the industry. Considering the significant difference between the forestry industry and the paper industry this research brief should be split into two separate documents.
Forestry & Paper	Industry insights	Inaccuracy	Corporations	D.N.A. - Inaccuracy	The brief is very focused on US laws and regulations, but many of US companies have facilities in Canada, and the Canadian context is not well represented in the brief. This can in some cases impact the materiality of the indicators. For example, most of the forests in Canada are Crown owned, which impacts forest certification, relations with first nations, forest adaptation to climate change, etc.
Forestry & Paper	Industry insights	Inaccuracy	Corporations	D.N.A. - Inaccuracy	The industry brief has a major and consistent flaw in the assumption that many companies are vertically integrated. By a large percentage this is the exception rather than the norm for the industry. Considering the significant difference between the forestry industry and the paper industry this research brief should be split into two separate documents.
Forestry & Paper	Industry insights	Inaccuracy	Corporations	D.N.A. - Inaccuracy	As noted earlier, the assumption that most companies are integrated is a major inaccuracy. It might be worth taking a fresh look at the brief knowing that there are two very different kinds of companies included within the sector (landowners and manufacturers) and revising as needed.
Forestry & Paper	Industry insights	Inaccuracy	Public Interest & Intermediaries	D.N.A. - Inaccuracy	In the very beginning the brief stated that paper companies are vertically integrated which may have been true in the 1990s but has not been true of paper companies for years.
Forestry & Paper	Industry insights	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	The chosen companies are small and local, whereas the industry is dominated by a few really large international ones.
Forestry & Paper	Land Use & Ecological Impacts	Add Issue	Market Participant	Biodiversity impacts	Land-use change and forest management have significant biodiversity and genetic diversity impacts. The only way to stop the 6th Great Extinction is to manage forests and land sustainably.
Forestry & Paper	Land Use & Ecological Impacts	Add Issue	Market Participant	degree of soil depletion	This is a relevant indicator in each land activity



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Corporations	Maybe	No uniform quantitative measures
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Corporations	Maybe	This is typically not a North American issue. The industry is in fact the leader in land use and sustainable forestry. Negative forest are due to urban sprawl and ag land conversion in the US.
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Corporations	Maybe	protected conservation status and endangered species habitat is changing quickly, and the potential impact would be hard to evaluate. Certification would already cover this risk, so the first metric would be redundant.
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Corporations	Maybe	The industry brief has a major and consistent flaw in the assumption that many companies are vertically integrated. By a large percentage this is the exception rather than the norm for the industry. Considering the significant difference between the forestry industry and the paper industry it is very difficult to identify any metric that is material to both industries. Land use is a good example. The relative importance of land use will depend on if the discussion id about a forest management plan or a paper mill.
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Corporations	Maybe	I have concerns about what "near" means and how that will be measured.
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Corporations	Maybe	The most significant land use and ecological impacts occur when forestland is permanently converted to other non-forest issues such as agriculture or development. Forest conversions are generally done by non-forestry and non-paper companies and therefore this is not a significant paper and forest industry related issue. The forestry and paper industry actually create a demand for wood that keeps companies and landowners engaged in forestry.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Corporations	Maybe	The forestry and paper industry is a broad sector. It includes companies that are fully integrated, i.e. own land, procure wood fiber, and manufacture products, as well as those that do not own land, but instead procure all their wood fiber and manufacture products. In fact, in the U.S. the majority of "paper" companies do not own land and procure the majority, or all of the wood fiber they use to manufacture products. As a result the impact/influence that these procurement companies have on landowners and forestland is limited. They can suggest and encourage sustainable forest management but they cannot require it. This disparity in the companies and their ability to influence land use and ecological impacts should be noted in any potential disclosure requirement
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Corporations	Maybe	Believe inquires on certified forest lands is relevant but description of forest management or sites with protected conservation status/endangered species habitat are already addressed within forestry certification management practices. RR0201-10 & RR0201-12 therefore are duplicative
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Corporations	Maybe	We believe that in a general sense many of the topics that we listed here as "Yes, but with reservations" may, in some - but not all – places and times - have an effect on our operations. However, in large part this depends on the final metrics employed. Further, although some of these measures could have a materially adverse effect on our operations in the future, we do not believe they do today, except to the extent we are already reporting on them in our securities filings.





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Corporations	Yes	While material, the Industry Brief focused on global deforestation rather than the U.S., where forested acres are constant or growing. Additionally, forest yield and management varies largely by geographic region; in the Southeast, the average pine rotation is 12-15 years. The Brief also completely missed the impact of urbanization on forest loss as represented by the Southern Forest Research Assessment; instead it seemed to focus on mismanagement. Additionally, it did not accurately portray the positive impact of fertilizer use on forest yields in managed forests -- allowing them to produce more on less acres -- and how modern application methods utilize minimum amounts for maximum impact. The Brief also did not correctly reflect the minimum impact of chemical use on U.S. managed forests, where the average application is the equivalent of 2-3 ounces per acre every 10 years. The related metrics should measure acres, not hectares -- again, this standard is designed for reporting to the SEC and should reflect U.S. measurements. Lastly, reporting on forests in or near protected sites is irrelevant as they cannot be subject to harvest (and, what is the definition of 'near' for reporting purposes?). An interesting sidebar is the discussion on [major forestry and paper company] conflict with Greenpeace; it doesn't mention that the forested acres in question are FSC chain-of-custody certified by the Rainforest Alliance.
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Market Participant	Maybe	At one time approximately 20 years ago, this was the top ecological concern in the press. Clear cutting of timber, ecological habitat and other concerns were, in many locales, headline news. We believe this topic has diminished in its materiality. Further, this is a topic that is difficult to measure its impact on financial statements, unlike other matters identified in this survey.
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Market Participant	Yes	This factor is relevant, specifically in region with old forest and with indigenous communities and it can turn into an obstacle for the company in the licence to operate
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Market Participant	Yes	According to the WWF, logging is impacting "old-growth and high conservation value forests."



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Public Interest & Intermediaries	Maybe	Forest land use is controversial, because depending of the forest renovation rules it may have practically no impact, or a major impact. Take the Scandinavian rules originating from 17th century requiring full renovation and compare them to North American concessions to clearcut forests without obligation to renew.
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Public Interest & Intermediaries	Maybe	Timber harvesting has ecological impacts on forest lands but is probably one of the most least impactful uses of land. Timber harvesting is highly visible and so while the land impacts are modest compared to other land uses and sectors, failure to apply BMPs can lead to negative reputation impacts and loss of social license.
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Public Interest & Intermediaries	Maybe	Using the describing environmental management policies seems redundant. In my opinion, reporting on how much land is certified FSC/SFI takes care of that answer.
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Public Interest & Intermediaries	Maybe	Third party certification programs like SFI, FSC and PEFC may already be covering this. It's included in SASB disclosure topic of Wood & Fiber Supply Chain Management.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Land Use & Ecological Impacts	Material Issue?	Public Interest & Intermediaries	Yes	<p>This is the key issue in my opinion, simply because of the ecological and human importance of forests globally. Well-managed forests, managed in accordance with sound ecological principles, is essential for protecting biodiversity and the environment in general, and therefore essential for a company to maintain its social license to operate and ensuring long-term access to resources. The first indicator being proposed, % of forestland in or near sites with protected conservation status or endangered species habitat – this is very difficult to report on (from direct experience), first because “in or near” is poorly defined and companies need stricter definitions than that (I note that this indicator is similar to a GRI indicator under G3). For example, refer to Resolute 2011 sustainability report, page 23, first paragraph under Biodiversity – rather than calculate this percentage, they opted to say “ALL of the woodlands owned or managed by Resolute are located within or near areas that play a role in maintaining biodiversity” [emphasis added]. This broad statement is, arguably, less useful than disclosing nothing.</p> <p>Second, this proposed indicator severely undervalues the collective value of forestland, whether it is protected or not, or whether it contains endangered species or not.</p> <p>I don’t have an alternative suggestion for this indicator, and I would recommend conferring with organizations with more technical expertise in biodiversity management than myself. I do agree that the second proposed indicator is critical.</p> <p>This is also the issue that garners the most attention from ENGOs, see Greenpeace, especially Greenpeace Canada.</p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Metric comment	Other Comment	Corporations	D.N.A. - Other Comment	It seems that many of the metrics in a number of areas could be subsumed by asking about certification. All the major certification programs cover a lot of the metrics you are after.
Forestry & Paper	Metric comment	Other Comment	Market Participant	D.N.A. - Other Comment	In several cases, I was not sure whether the proposed metrics would be cost-effective or not; my answers are logical conjecture (since the survey required that an answer be given) but I did not feel confident in those responses.
Forestry & Paper	Metric comment	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	For the metrics associated with land use, indigenous peoples and wood and fiber, i believe these can be combined into one metric since forest certification covers them.  its important to note that i answered no to the following sections due to the lack of technical knowledge - Greenhouse Gas, Air Quality, Energy, Water, Waste, workforce, and fair labor practices.
Forestry & Paper	Metric comment	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	I found the research brief very useful for giving me a foundation to begin with. I note that the proposed metrics are largely impact-focused. Would SASB also consider "metrics" that are exposure-focused? Meaning, indicators that indicate the degree to which a company may have an impact or faces a sustainability risk? One example is "list countries where fibre is procured from", or "number of labour agreements requiring renewal in the next three years". Just a thought.



Forestry & Paper	Metric comment	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	<p>I would like to include the comments CRS provided for SASB's transportation sector:</p> <p>January 2, 2014</p> <p>Submitted electronically via: <a href="mailto:comments@sasb.org">comments@sasb.org</a></p> <p>Regarding: Center for Resource Solutions Comments on Sustainability Accounting Standards Board (SASB) Program for Technology &amp; Communications Sector</p> <p>Background</p> <p>Center for Resource Solutions (CRS) appreciates the opportunity to submit comments on the proposed revisions to TC0101, TC0102, TC0103, TC0201, TC0301 and TC0401. CRS is a 501.c.3 nonprofit organization. CRS creates policy and market solutions to advance sustainable energy, in part through the Green-e Energy consumer protection program. Green-e Energy certifies sales of high-quality renewable electricity and RECs to customers throughout the US and Canada. Nearly three quarters of US retail voluntary renewable electricity and Renewable Energy Certificate (REC) purchases are certified through Green-e Energy. We appreciate SASB's effort to include renewable energy in disclosure guidance and accounting standards and for referencing Green-e.</p> <p>As background to our comments, only through the purchase and use of RECs can any electricity user in the US and Canada accurately claim to be using renewable electricity. A REC represents the non-electricity attributes, including all the environmental attributes, of one megawatt-hour of renewable electricity generation. RECs are the means to track generation and consumption of renewable electricity, because the sources of electricity put onto the grid cannot physically be tracked through individual electrons; some form of contractual accounting must</p>



					<p>be used for such tracking, and this is accomplished through RECs.</p> <p>RECs may be bought and sold independent of electricity, or bundled with electricity purchased through a renewable power purchase agreement (PPAs) or voluntary renewable electricity program offered by an electric service provider or utility. Likewise, on-site generation facilities generate electricity and RECs. In all cases, the REC is the way to track and account for the fact that the electricity generation was renewable, and also make the claim of using renewable electricity from the generating facility.</p> <p>Our comments are applicable to all SASB standards that reference renewable energy use by reporting entities, and we hope that SASB will consider these comments and issues during the development and revision of all SASB standards.</p> <p>Renewable PPAs and On-Site Generation Must Include RECs</p> <p>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 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.</p> <p>Add Reference to Voluntary Renewable Electricity Programs</p>
--	--	--	--	--	--



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.

Distinguish between Electricity and Energy,

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 is measured in MWh, and so the registrants' calculations will be simplified with this clarification.

Distinguish between Renewable and Non-renewable Electricity Sources

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



					<p>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.</p> <p>Appropriate Reference to Green-e Energy Certification</p> <p>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.</p> <p>Suggested Language</p> <p>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 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.”</p>
--	--	--	--	--	---





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
					<p>RECs Should Be Applied to Scope 2 Emissions Only</p> <p>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.</p> <p>Please feel free to contact us with any questions you may have on these comments or if we can be of any further assistance to you on electricity and greenhouse gas accounting in SASB standards. We have worked closely with the US Green Building Council on the renewable electricity and carbon offset portions of their LEED standards, and have provided support to other standards such as Cradle to Cradle and Green Seal around the same issues, and we would be happy to assist SASB as well. We can be reached at 415-561-2100 and <a href="mailto:energy@green-e.org">energy@green-e.org</a>.</p> <p>Thank you,</p> <p>Michael Leschke</p> <p>Green-e Energy Associate</p> <p>Center for Resource Solutions</p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Metric comment	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	Many of the metrics you focused on including are backward looking metrics that may tell you about a company's past performance but do not tell investors anything about a company's future performance.
Forestry & Paper	Metric comment	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	Most of the topics and related metrics are already regulated and possibly redundant. The material aspect for investors are no. of non-compliance incidents and damages.
Forestry & Paper	New Angle	Add Issue	Market Participant	Alternative Supply  [WOOD & FIBER SUPPLY CHAIN MANAGEMENT]	It is probably beyond the scope of SASB disclosure but there is no focus on evaluating, measuring, changing the focus of the industry to more renewable sources such as Bamboo or changing the demand side to more sustainable alternatives.
Forestry & Paper	New Angle	Add Issue	Market Participant	Tenure & Use Rights  [LAND USE & ECOLOGICAL IMPACTS]	Length and security of tenure/use rights are particularly relevant in the EMs - could perhaps be part of the "Land Use & Ecological Impacts" disclosure topic
Forestry & Paper	New Angle	Add Issue	Public Interest & Intermediaries	genetically modified organisms  [WOOD & FIBER SUPPLY CHAIN MANAGEMENT]	GMO tree fiber will come on line in North America in the near future and is an area of contention for many global and local NGOs



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	New Angle	Add Issue	Public Interest & Intermediaries	Third party disposal sites  [HAZARDOUS WASTE MANAGEMENT]	Connected to waste management perhaps, but shipping off surplus or waste material to landfills, biomass or conventional power plants have consequential carbon and cost impacts that may be worth measuring (like done now) and disclosing (less like).
Forestry & Paper	New Issue	Add Issue	Market Participant	Biomass energy sustainability criteria	Currently there are no accepted industry standards for sustainable forest management for biomass (wood pellets). Forest management for wood pellet production and other biomass energy products are having a negative impact on U.S. forests.
Forestry & Paper	New Issue	Add Issue	Public Interest & Intermediaries	Employee attraction and retention  [EMPLOYEE RECRUITMENT, DEVELOPMENT & RETENTION]	Despite the economic challenges faced by the forest industry, it faces significant challenges from an employee attraction and retention standpoint. First, it is an ageing work force with a large portion set to retire in the short term. Second, it faces competition from mining and energy firms, and therefore must work harder to attract and retain young talent, especially in terms of skilled and highly skilled labour.
Forestry & Paper	New Issue	Add Issue	Public Interest & Intermediaries	Innovation and product sustainability for overall business growth  [PRODUCT DESIGN FOR ENVIRONMENTAL EFFICIENCY]	Paper industry product mix is facing commodity pressures and large levels of substitution. Continuous innovation and new market assessment is needed by each company for business sustainability.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	New Issue	Add Issue	Public Interest & Intermediaries	Product innovation and sustainability  [PRODUCT DESIGN FOR ENVIRONMENTAL EFFICIENCY]	Traditional forest product companies need to think more innovatively about the possibilities of forest products, what innovative products can be developed, how can forest products help consumers reduce their own impacts. Some companies have done a lot here (in Scandinavia mostly) but most have not. FPAC has also put some research into this topic.
Forestry & Paper	New Issue	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment  [GMOs]	Please consider GMOs as an additional materiality issue
Forestry & Paper	No action needed	Other Comment	Corporations	D.N.A. - Other Comment	Pretty much covered everything in my comments.
Forestry & Paper	Regulations	Add Issue	Public Interest & Intermediaries	compliance with foreign and domestic laws	Companies should be aware of their governance, risk and compliance risks and be taking active steps to assess, monitor and maintain effective compliance programs
Forestry & Paper	Regulations	Inaccuracy	Corporations	D.N.A. - Inaccuracy	Lack (in some areas) of understanding of the current regulatory framework that this industry currently operates under and the level of current reporting to regulatory agencies.
Forestry & Paper	SASB Approach	Other Comment	Market Participant	D.N.A. - Other Comment	Has SASB considered organizing a discussion forum for each IWG so that the provided research document can be discussed?
Forestry & Paper	Survey comment	Other Comment	Corporations	D.N.A. - Other Comment	There was no way to capture the level of expertise of the respondents. I am an expert in some areas but know very little in other areas. Having the respondents provide their perceived level of knowledge in each area would have allowed a better and more informed parsing of their results. Average responses here are of limited use. It was like a medical survey asking dermatologists their opinion on cardiac topics.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Waste Management	Add Issue	Corporations	Chemical additives and process agents management  [HAZARDOUS WASTE MANAGEMENT]	Paper industry uses chemicals for processing, some of them can be hazardous, either in their production, process use, or end use. Chemical hazards should be taken into account in paper manufacturing as a material aspect/environmental impact.
Forestry & Paper	Waste Management	Add Issue	Corporations	Chemical use  [HAZARDOUS WASTE MANAGEMENT]	Chemical use is heavy within this industry, and this is a topic that our customers are asking about increasingly. There are also clear situations where our use and/or phase-out of a chemical has impacted our value.
Forestry & Paper	Waste Management	Add Issue	Public Interest & Intermediaries	Environmental incidents	Environmental incidents of non-compliance, and associated fines are an indication of the effectiveness of environmental policies and management systems. If a company has incurred multiple significant fines, this is a red flag that the company may be suffering from poor management.
Forestry & Paper	Waste Management	Material Issue?	Corporations	Maybe	Not significant.
Forestry & Paper	Waste Management	Material Issue?	Corporations	Maybe	(1) Much of the substantiating information was either significantly dated or derived from non-US companies. (2) While hazardous material disposal could be material, the non-hazardous waste from most paper and wood manufacturing operations are beneficially used(47%) or disposed of in mostly privately-owned landfills. To my knowledge, neither of these disposal options have received public attention that is detrimental to the financial performance of the industry. (3) See AF&PA's 2014 Sustainability report for data reflecting reduced industry hazardous and non-hazardous waste generation.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Waste Management	Material Issue?	Corporations	Maybe	Paper industry generates waste (paper scraps) but in majority recycles it. the other categories of waste are "ordinary" waste such as packaging, and can be recycled as welll withoit major constraints and difficulties.
Forestry & Paper	Waste Management	Material Issue?	Corporations	Maybe	<p>I have the same reservations with Waste Management as with Air Quality.</p> <p>I agree that this should be a DISCLOSURE topic, but I view disclosure and material as two separate items.</p> <p>I can't say Waste Management is material per the Supreme Courts definition when investors do not ask about this topic, and my company has yet to determine how this issue impacts our value.</p>
Forestry & Paper	Waste Management	Material Issue?	Corporations	Maybe	Not all Mills will have data on percentages of landfill vs recycled vs hazardous. In some cases Mills are burning waste to energy onsite, how is this considered? What if burned offsite? What about Mills that landspread some of their waste. Would suggest focus only on hazardous waste.
Forestry & Paper	Waste Management	Material Issue?	Corporations	Maybe	We believe that in a general sense many of the topics that we listed here as "Yes, but with reservations" may, in some - but not all – places and times - have an effect on our operations. However, in large part this depends on the final metrics employed. Further, although some of these measures could have a materially adverse effect on our operations in the future, we do not believe they do today, except to the extent we are already reporting on them in our securities filings.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Waste Management	Material Issue?	Corporations	No	Total amount of waste is highly dependent on process type, therefore results would not be meaningful and comparable. The definition of hazardous waste depends on the jurisdiction, and therefore again, results would not be comparable. For example, in some jurisdictions, used oil are considered hazardous (Quebec) but not in others (most US states). Because hazardous wastes constitute only a small % of total wastes, impact would not be material.
Forestry & Paper	Waste Management	Material Issue?	Corporations	No	The industry brief has a major and consistent flaw in the assumption that many companies are vertically integrated. By a large percentage this is the exception rather than the norm for the industry. Considering the significant difference between the forestry industry and the paper industry it is very difficult to identify any metric that is material to both industries. Waste management is a good example. Waste is simply not material to a forestry operation. Waste at a paper mill is generated either as a bi-product of energy production and burning of fuels or waste he operations related to the use of recycled fibers. The more recycled fiber a mill uses the more waste it will generate. Also the "dirtier" the source of recycled material the more waste generated. A mill may be viewed in a negative light by the amount of waste it generates when actually it may be increasing the amount and type of recycled fiber.
Forestry & Paper	Waste Management	Material Issue?	Corporations	Yes	All waste disposal laws must be followed. Minimizing waste typically improves the bottom line.
Forestry & Paper	Waste Management	Material Issue?	Corporations	Yes	In the forestry and paper industry we have had requests for increased recycled content for a number of years. Part of this seems to be driven by ENGO/activist activity but it now seems that customers are also starting to focus more on the end of life impacts of products (e.g. interest in LCA's and cradle-to-cradle programs). The "circular economy" and it's ability to lessen or eliminate waste, is a frequent topic at conferences and in the media. Taken together, these indicate direct impacts on both waste management and product design which will have to be addressed by companies



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Waste Management	Material Issue?	Market Participant	Maybe	Waste management is less relevant in this kind of industry, because this Sector has an inherent incentive to reduce wood wastes and to put them into production
Forestry & Paper	Waste Management	Material Issue?	Public Interest & Intermediaries	Maybe	First, hazardous waste generation is low. Second, a main type of waste generated by paper and pulp companies is organic wood waste. A well-managed company would strive to use natural resources (e.g. timber) as efficiently as possible to begin with because it is an expensive input ('fiber loss' is a common KPI already). After, the wood waste isn't sent to landfill – it's used as biomass and converted to energy. It is material, I am just saying that there is already business incentive for it to be managed well.
Forestry & Paper	Waste Management	Material Issue?	Public Interest & Intermediaries	Maybe	I don't understand the metric "percentage of waste recycled". If it's recycled in house, it's not waste. Is that referring to waste that is sold to other industries, such as sludge to fertilizer companies?
Forestry & Paper	Waste Management	Material Issue?	Public Interest & Intermediaries	Maybe	Waste Management, if material is already reported in 10K reports under RCRA and CERCLA disclosure.
Forestry & Paper	Waste Management	Material Issue?	Public Interest & Intermediaries	Yes	Waste management in pulp industry is usually solved by burning the lignin and other waste, thus producing energy, and saw mill waste, such as shavings can be used as pulp and paper raw material. Thus the amount of waste itself is not significant, but any waste which cannot be used for energy or as raw materials.
Forestry & Paper	Waste Management	Material Issue?	Public Interest & Intermediaries	Yes	Already highly regulated. What could be useful is reporting non-compliance incidents, fines and violations.
Forestry & Paper	Water Management	Material Issue?	Corporations	Maybe	Already being publically reported via NPDES program
Forestry & Paper	Water Management	Material Issue?	Corporations	Maybe	Total fresh water withdrawn, areas with baseline water stress and BOD and TSS discharges would be useful. Percentage recycled is impossible to calculate in a meaningful way and would not provide any material information. Data quality would be highly questionable.





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Water Management	Material Issue?	Corporations	Maybe	<p>The industry brief has a major and consistent flaw in the assumption that many companies are vertically integrated. By a large percentage this is the exception rather than the norm for the industry. Considering the significant difference between the forestry industry and the paper industry it is very difficult to identify any metric that is material to both industries. Water management is a good example. Water management for a forest owner may mean protecting water ways during harvesting. Water management for a paper mills means water withdrawal, use, cleaning and return.</p> <p>Water is a very localized issue and the location of a mill, the percent of virgin to recycled fiber and the water source all contribute to the materiality of water to a specific mill site. If a particular company has multiple mills, reporting on water becomes just that much more complex. Also water withdrawal is not necessarily a good metric of water consumption. Paper mills actually consume a relatively small percentage of the water that comes into a mill.</p>
Forestry & Paper	Water Management	Material Issue?	Corporations	Maybe	<p>With compliance being a given, water management issues have not had an impact on my company's value.</p> <p>Disclosure on an issue is one thing, but if the lens is materiality then I have not seen water management come to the fore-front as a material issue for us. Although, I will admit that water will become a material issue in the near future.</p>
Forestry & Paper	Water Management	Material Issue?	Corporations	Maybe	<p>Water consumption, versus water withdrawn and effluent discharge, is a more accurate metric of measurement. percentage of recycled is difficult to measure.</p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Water Management	Material Issue?	Corporations	Maybe	We believe that in a general sense many of the topics that we listed here as "Yes, but with reservations" may, in some - but not all – places and times - have an effect on our operations. However, in large part this depends on the final metrics employed. Further, although some of these measures could have a materially adverse effect on our operations in the future, we do not believe they do today, except to the extent we are already reporting on them in our securities filings.
Forestry & Paper	Water Management	Material Issue?	Corporations	Yes	While material, the water management metrics only refer to water withdrawals which does not accurately portray water use by the industry; in fact, it completely misrepresents the industry's water impact. AF&PA, in its 2014 Sustainability report, states that the forest products industry directly returns 88% of the water it withdraws.
Forestry & Paper	Water Management	Material Issue?	Corporations	Yes	water use and water rights are becoming important topics. Companies that do not have sound risk abatement plans to ensure they have a continuous water supply will not be viable in the long term.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Water Management	Material Issue?	Corporations	Yes	<p>The forestry and paper industry uses large volumes of process water in the manufacture of products. This water is ultimately returned (&gt;90+%) to it's source but availability and low cost are essential for the business model to continue to work. Water availability and scarcity are emerging issues for large metropolitan areas as well as smaller towns and cities globally. As water availability becomes more of an issue for these locations municipalities and states will take more interest in large-volume water users. As a result there is a high probability that water rights, availability, and the (potential) increased cost of water usage may impact the viability of manufacturing facilities in the future.</p> <p>On the resource side, forestry companies adhere to voluntary best management practices (BMP's) to ensure compliance with the Clean Water Act. As more focus is placed on water availability, water quality is likely to become a focal point as well. This may result in increased regulation around harvesting activities (e.g. voluntary BMP's become mandatory), or attempts to enact statewide forest practices acts. These would have the potential to reduce fiber availability, increase costs and impact the viability of companies.</p>
Forestry & Paper	Water Management	Material Issue?	Market Participant	Yes	An increasing focus on worldwide water quality and availability will sharpen the focus on mass water polluters like pulp and paper mills. Significant sums are anticipated that will need to be spent to comply with water quality regulations above and beyond those mandated today.
Forestry & Paper	Water Management	Material Issue?	Market Participant	Yes	Water management is material, while water is a primary resource for this industry and also because it is relevant for the impact on local communities and that there is no competition for the water resources for the local communities



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Water Management	Material Issue?	Public Interest & Intermediaries	Maybe	Water management varies in materiality at different points in the value chain. In forest management, it is highly material as changes in land use and forest management practices have the ability to impact water systems. In pulp and paper operations, companies need to intake large volumes of water (typically from a body of water opposed to municipal sources) for various industrial processes, but the actual amount of water that is consumed, for example, by the final product, is quite low. Much (my understanding was up to 90%) of the water taken in is treated and released back to the body of water it was taken from, with monitors in place to ensure that large releases at a time do not disrupt ecological activity. It is noted that companies are required to measure volume of effluent, but not water intake – so they do not have a strong grasp of water used. They have to look at water released and estimate how much is absorbed by products – so, data collection processes could be improved. Finally, moving along the value chain, wastewater (or effluent) management is also relatively material, but BOD, TSS etc. are also highly regulated and companies have to pay surcharges for them, so also in their best interest to improve wastewater management in order to reduce costs.
Forestry & Paper	Water Management	Material Issue?	Public Interest & Intermediaries	Maybe	The industry has already made great strides in reducing it's impact on water quality over the years. Additionally, metrics for water management are not universal, companies report their water management and use in different ways making it not easily comparable.
Forestry & Paper	Water Management	Material Issue?	Public Interest & Intermediaries	Yes	Water is the key production material in pulp and paper, so it is definitely material. However, the emission rules may be stricter than the incoming water quality, so the mill can clean water during the process, if say required phosphorus rates of outgoing water are lower than in the incoming water.
Forestry & Paper	Water Management	Material Issue?	Public Interest & Intermediaries	Yes	Fiber products require significant amounts of water to be generated. The sector has significant dependence on adequate water supplies in areas where water is scarce and to regulations concerning water supplies and water quality impacts.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Water Management	Material Issue?	Public Interest & Intermediaries	Yes	Water is twice material for pulp and paper operations. Once - for use, intensity, influent and effluent treatment; Once for water-access. There are not many paper mills in water-stressed areas - and those that are located in increasingly water-scarce areas are feeling the hit. The linked describes the situation of a mill in East of the Mississippi, a categorically "water-rich" area.  <a href="http://apr.org/post/low-river-levels-impact-paper-mills">http://apr.org/post/low-river-levels-impact-paper-mills</a>
Forestry & Paper	Water Management	Material Issue?	Public Interest & Intermediaries	Yes	Water is one of the biggest natural resources that is using in the pulping process. <a href="http://www.paperonline.org/environment/clean-technology/water-usage">http://www.paperonline.org/environment/clean-technology/water-usage</a>  I think, the paper industry can be at the forefront if they are able to manage the wise use of this resource.
Forestry & Paper	Water Management	Material Issue?	Public Interest & Intermediaries	Yes	Salinity level can compromise freshwater quality.
Forestry & Paper	Water Management	Material Issue?	Public Interest & Intermediaries	Yes	Water consumption, recycling, water-stress assessment and compliance are relevant. Water quality is highly regulated already and possibly redundant to report here.
Forestry & Paper	Wood & Fiber Supply Chain Management	Add Issue	Corporations	Regulatory framework	Countries are implementing régulations to control logging and circulation of wood sourced products. This might not be clearly stated in topic "Wood & Fiber Supply Chain Management". Examples of régulations include: EU-Timber Regulation, Lacey Act (US), Australian Act.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Corporations	Maybe	<p>RR0201-20--procurement is not relevant--this is a matter of consumer demand and market access (which is limited) Since this is intended for forestry companies and Mills, I would suggest its more important to know what percentage of owned lands are certified versus procurement. Additionally, for recycled Mills this becomes moot since effective 2016 all recycled fiber will be considered certified.</p> <p>RR0201-12 Is this not generally defined by the type of paper the Mill produces. i.e. if the company specializes in virgin than the answer is zero, if its a recycled Mill than it's 100%.</p> <p>RR0201-22 This is dependent upon consumer demand not on company interest or desire. Therefore not a true representation of a company's sustainability</p>
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Corporations	Maybe	We believe that in a general sense many of the topics that we listed here as "Yes, but with reservations" may, in some - but not all – places and times - have an effect on our operations. However, in large part this depends on the final metrics employed. Further, although some of these measures could have a materially adverse effect on our operations in the future, we do not believe they do today, except to the extent we are already reporting on them in our securities filings.
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Corporations	Yes	No quantitative measures.
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Corporations	Yes	Fiber supply is the number one cost to operate. Must have sound management to ensure continued economic viability.
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Corporations	Yes	Primary source of our raw materials and we have great systems in place to verify compliance with approved standards.
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Market Participant	Maybe	N/A



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Market Participant	No	Materiality must be viewed in the context of the surrounding considerations. Given the significance of the other considerations, and with a view that it does not make sense for all topics to be material, this is of a more specific concern.
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Market Participant	Yes	The supply chain is very relevant in the paper industry and concerns its wood and fiber supply chain management
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Market Participant	Yes	Identify all sources of materials
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Public Interest & Intermediaries	No	Companies generally share key details via benchmarking and working with key suppliers. Advantages or differences are temporary.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Public Interest & Intermediaries	Yes	<p>This is a highly material issue. Even companies that own or manage forestland may purchase a large percentage of their total fibre input from third-party suppliers. Companies are quick to tout that 100% of owned or managed forests are 100% certified, and less quick to report that only 20% of their total fiber input is actually from a certified forest. Supply chain transparency is key in order to ensure that fiber is not being purchased from illegal or controversial sources, and to shed light on potentially hidden supply chain risks. One challenge to note here that in the U.S., there are a large number of small tree farmers for which certification is cost prohibitive, but larger companies, such as Domtar, have overseen and facilitated group certification of these suppliers. I would suggest a management discussion and analysis on how companies are working with small suppliers to increase the volume of certified forests.</p> <p>Regarding recovered fibre, this needs to be considered from a life cycle perspective. Not all mills are equipped to handle recovered fibre, and transporting recovered fibre to mills that can handle it has GHG impacts. The availability of recovered fibre also depends on collection systems, typically run by municipalities. It is also noted that recovered fibre is a commodity, and is largely bought by China (which of course transporting it there would also be GHG intensive). This isn't to say that companies shouldn't still strive to utilize recovered fibre, but I don't see how it is material.</p>
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Public Interest & Intermediaries	Yes	The supply chain management is closely related to supply certifications (PEFC and FSC), which have grown material among many industry product users.
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Public Interest & Intermediaries	Yes	Disclosure and transparency is needed to reduce risk of corrupt practices
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Public Interest & Intermediaries	Yes	More and more companies are requiring FSC certification on the paper and wood products procured for final use or as a raw material.





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Wood & Fiber Supply Chain Management	Material Issue?	Public Interest & Intermediaries	Yes	Links: SFI, FSC and PEFC certifications and how companies are following this.
Forestry & Paper	Wood & Fiber Supply Chain Management	Other Comment	Market Participant	D.N.A. - Other Comment	Some indicators are very general, the role of certification is often stressed, but often certification is not trustable
Forestry & Paper	Workforce Health & Safety	Material Issue?	Corporations	Maybe	While the safety of our employees is of utmost importance, we capture and report this information in a variety of ways and I am not sure SASB needs to duplicate these efforts.
Forestry & Paper	Workforce Health & Safety	Material Issue?	Corporations	Maybe	The forest products industry has made great improvements in safety recordable incident performance over the years to the point where it is no longer a significant and material issue. Safety incidents at a facility are promptly reported publicly to OSHA and therefore should already be in the public domain.
Forestry & Paper	Workforce Health & Safety	Material Issue?	Corporations	Maybe	We believe that in a general sense many of the topics that we listed here as "Yes, but with reservations" may, in some - but not all – places and times - have an effect on our operations. However, in large part this depends on the final metrics employed. Further, although some of these measures could have a materially adverse effect on our operations in the future, we do not believe they do today, except to the extent we are already reporting on them in our securities filings.
Forestry & Paper	Workforce Health & Safety	Material Issue?	Corporations	No	TIR and fatality rates are already well reported through OSHA. 'Near miss frequency rates' are not reportable to OSHA and parameters for any required reporting need to be defined. As mentioned before, some of the discussions – the IARC research for example -- are extremely dated and does not reflect current conditions.
Forestry & Paper	Workforce Health & Safety	Material Issue?	Corporations	No	Generally the industry has a good health and safety record. Based on similar information, SASB dropped this category for the Containers and Packaging standard and it should be dropped here as well.
Forestry & Paper	Workforce Health & Safety	Material Issue?	Corporations	Yes	This matter is already compliance driven. OSHA 300 logs are public information.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Workforce Health & Safety	Material Issue?	Corporations	Yes	Must be in compliance with OSHA regulation. Safe workplaces are typically positive in terms of financial success to the organization.
Forestry & Paper	Workforce Health & Safety	Material Issue?	Corporations	Yes	injury rate can have an impact on costs (fines, etc.) but also on hiring and reputation.
Forestry & Paper	Workforce Health & Safety	Material Issue?	Market Participant	Maybe	As automation and regulation increases, workplace safety has improved. Contrary to the views of pro-labor groups, productivity and safety rates have improved over the past three decades. This is simply not the material issue it once was.
Forestry & Paper	Workforce Health & Safety	Material Issue?	Market Participant	Yes	This very relevant in region where labour rights are not so protected, as for example in emerging markets
Forestry & Paper	Workforce Health & Safety	Material Issue?	Market Participant	Yes	In Brazil for example, trees are checked by individual workers for disease on a monthly basis and diseased trees removed before there affliction can spread. This is potential preferable to spraying all trees all the time for disease but requires greater labor.
Forestry & Paper	Workforce Health & Safety	Material Issue?	Public Interest & Intermediaries	Maybe	Even if the area is important, it does not have really any industry specific topics, so it seems questionable to have an industry standard.
Forestry & Paper	Workforce Health & Safety	Material Issue?	Public Interest & Intermediaries	Maybe	WHS is an issue for high risk industries such as mining, dredging etc. While WHS is essential to manage in any industry, once could assume that the basic standards are been met due to regulatory requirements.
Forestry & Paper	Workforce Health & Safety	Material Issue?	Public Interest & Intermediaries	Maybe	This is a contractual matter between an operator and their insurer, and a reporting matter on a very local basis. Rolling up disclosure on safety metrics encourages outsourcing to keep metrics low for the compliant filer.
Forestry & Paper	Workforce Health & Safety	Material Issue?	Public Interest & Intermediaries	No	Paper manufacturers have a good record on work place health and safety (see AF&PA's sustainability report). This metric was removed from the containers & packaging standard because paper companies do have a good safety record.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Forestry & Paper	Workforce Health & Safety	Material Issue?	Public Interest & Intermediaries	Yes	The industry has a high rate of industrial accidents and hazards which add considerable operating cost
Forestry & Paper	Workforce Health & Safety	Material Issue?	Public Interest & Intermediaries	Yes	The entire process poses many many opportunities for injury and/or death including mechanical (high-pressure nips) and chemical (corrosive and toxic chemicals and gases) safety.
Forestry & Paper	Workforce Health & Safety	Material Issue?	Public Interest & Intermediaries	Yes	Monitoring chronic health effects could be of importance in the long-term.
Fuel Cells & Industrial Batteries	Energy Management	Material Issue?	Corporations	Maybe	<p>Energy management is difficult to compare across companies and industries. Energy use is a function of many factors including the degree of vertical integration, production rate and type of manufacturing/assembly process. An example is a company that reduces energy use by 10% but expands the production rate/sales growth by 20% may not look favorable.</p> <p>This proposed metric requires disclosing key aspects of a company's operation that could be useful to competitors, particularly privately-held competitors that will not be providing the same public sustainability disclosure.</p>
Fuel Cells & Industrial Batteries	Energy Management	Material Issue?	Market Participant	Maybe	If I understand Energy Management as a producer-side issue, it's less material than other items such as user efficiency, occupational safety, or sourcing.



<p>Fuel Cells &amp; Industrial Batteries</p>	<p>Ind. Brief comment</p>	<p>Inaccuracy</p>	<p>Corporations</p>	<p>D.N.A. - Inaccuracy</p>	<p>o Why are fuel cells combined with the battery industry?</p> <p>Our manufacturing process is an assembly process. This language doesn't apply to [major fuel cell and industrial batter company] and very well may cause investors concern with something that isn't relevant to us:</p> <p>o Fuel cell and industrial battery manufacturing poses inherent dangers to employees. Exposure to hazardous chemicals, electrical hazards, explosive materials, heavy machinery, and pressurized equipment poses physical risks.</p> <p>We disagree with this messaging by SASB and choice of wording. We are subject to the same regulation that any USA manufacturer is subject to but nothing unusual or 'heavy'. Fuel cell manufacturing is very different than battery manufacturing, as we note above.</p> <p>o The Fuel Cells &amp; Industrial Batteries industry is subject to heavy regulation by multiple federal, state, local, and foreign regulatory standards, including those related to human and environmental health and safety laws, the management and disposal of hazardous substances, and the use of key materials.</p> <p>Please be careful to understand the industry. Our commercial fuel cell power plants are based on carbonate technology and we are in the process of commercializing solid oxide fuel cell technology. Neither use platinum as a catalyst. Platinum is used by low temperature fuel cells. This is an easy metric for us to meet though isn't relevant and we don't want SASB to potentially confuse investors or create concern where no risk exists.</p> <p>o Platinum is considered to be a key material, whose costs and limited availability are limiting the widespread development of fuel cells (particularly Proton Exchange Membrane (PEM) cells).</p> <p>Why is this unique to fuel cell companies? This comment is relevant to</p>
--	---------------------------	-------------------	---------------------	----------------------------	---



				<p>any company utilizing a global supply chain and in this day-and-age, most companies of any size that are selling to global markets are utilizing a global supply chain. Also, why is this a sustainability factor rather than a general risk factor and why is SASB focusing on this?</p> <p>o Fuel cell and industrial battery companies rely on increasingly complex and geographically diverse supply chains for critical material inputs, magnifying the risks of supply disruptions.</p> <p>This is irresponsible to selective cite one low-quality market research firm that was referenced by the media two years ago as some type of global industry fact that is relevant, much less relevant today. Where is the quantitative support for the assertion? If there is a desire to focus on costs, then utilize a levelized cost of energy (LCOE) with clearly stated cost of capital, amortization period assumptions, availability and capacity factor, cost of transmission (if required) and cost of land. This is then applicable to other power industry groups. Our power plants are cost competitive in the markets in which we compete and we already publicly disclose LCOE so welcome an honest and fair comparison based on facts, not media speculation.</p> <p>Statement: According to industry analysts, one of the major barriers to greater fuel cell adoption is their high cost relative to incumbent energy generation sources. Source: 2013 article about a Lux Research report - <a href="http://earthtechling.com/2013/01/hydrogen-fuel-cell-future-facing-a-cost-roadblock/">http://earthtechling.com/2013/01/hydrogen-fuel-cell-future-facing-a-cost-roadblock/</a></p> <p>o 'Risk Factors' in 10-K filings seem to be a favored source of information for SASB. Companies generally publish a very extensive and comprehensive list of risk factors with input from outside counsel, but there is no probability factor associated with the risk factors. SASB needs to consider the probability of the risk factors actually occurring prior to placing in inordinate amount of weight on specific factors. Or in the case of the following, consider the overall impact to the business of rising power costs as [major fuel cell and industrial batter company] Energy actually benefits as we will likely sell more fuel cell power plants</p>
--	--	--	--	---



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
					with rising grid costs:  A number of top companies in this industry (including Enersys, FuelCell Energy, Ultralife Corp, and others) cite concerns about increased (or increasing) energy costs in their 10-K or 20-F SEC filings. Ultralife Corp. reported the following concerns in its 2013 10-K report: "We use various utilities to provide heat, light and power to our facilities. As energy costs rise, we continue to seek ways to reduce these costs and will initiate energy-saving projects at times to assist in this effort. It is possible, however, that rising energy costs may have an adverse effect on our financial results."
Fuel Cells & Industrial Batteries	Industry insights	Add Issue	Public Interest & Intermediaries	Environmental Impact	As the costs associated with regulating the environmental impact of both production and recycle continues to rise and appears poised to increase both domestically and globally, it will be critical component in impacting a company's resiliency in staying ahead of the regulatory curve.
Fuel Cells & Industrial Batteries	Industry insights	Add Issue	Public Interest & Intermediaries	social impact	re changes to transportation dynamics, smart grid, and distributive generation Infrastructure
Fuel Cells & Industrial Batteries	Industry insights	Inaccuracy	Market Participant	D.N.A. - Inaccuracy	My knowledge of this field is only general, however, I wasn't sure why the aspect of batteries for energy storage and smart grids was not underlined. Is it part of another industry brief? Also, I am familiar with Toshiba's batteries - and no Japanese companies were mentioned in the brief.
Fuel Cells & Industrial Batteries	Industry insights	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	Success in this industry is contingent on managing raw material availability and pricing, operational costs and efficiencies, and EHS impacts. Companies that incorporate diversity from a sourcing perspective and operate within very tight processes will have the greatest success. As the global community catches up with the US from an EHS standpoint, the company that can operate in a cost effective manner while meeting strict EHS standards will gain market share.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Fuel Cells & Industrial Batteries	Metric comment	Other Comment	Market Participant	D.N.A. - Other Comment	It would be helpful to establish correspondence with other existing ESG reporting frameworks, especially when it comes to KPIs, to ensure the work expected from companies is optimized and not duplicated.
Fuel Cells & Industrial Batteries	New Angle	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment  [HAZARDOUS WASTE MANAGEMENT] + Other issues already in IWG Issue List.	<p>Summary: Environmental Footprints for Fuel Cells are as important as with any other manufacturing process. The idea of incentivizing the industry (tax credits) to reduce GHG is important, since the industry is competing with other types of fuel (coal, petroleum, etc.) that have large incentives.</p> <p>Hazardous Waste (RCRA) is very important since some of the components of fuel cells and energy storage, in general, are hazardous. It would be good to seek markets that could re-use these hazardous materials. One avenue would be to reduce the existing level within the waste and subdivide concentrations if it in different applications where only a portion is used. This decreases the initial impact of a larger quantity of material (as waste) and distributes it amongst different products.</p> <p>Life Cycle Analysis is important for viewing the overall impact of the process – from beginning (mining/extraction) through development, use and finally end-of-life. Many forward-thinking firms are reducing final quantities of material and reusing them in same, or other products. It would be good if research was partially government funded for seeking alternatives.</p> <p>Worker health/safety should, correspondingly, be facilitated with Life Cycle Strategies implementation to reduce overall waste. It is also imperative that workers receive education reflecting not only hazards, but also the need for their reduction and mitigation. In effect, the culture of the entire firm should be current (on board) with this.</p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Fuel Cells & Industrial Batteries	New Issue	Add Issue	Corporations	Training	Training across the entire organization as to what these devices do and how they benefit the company's energy goals
Fuel Cells & Industrial Batteries	New Issue	Add Issue	Market Participant	GHG emissions  [GHG EMISSIONS]	Not sure whether this is integrated in the energy management / product design aspects but GHG emissions would be very relevant in a two degree celsius scenario, with increasing CO2 abatements costs.
Fuel Cells & Industrial Batteries	Product Design & End-of-Life Management	Material Issue?	Corporations	Yes	Product Design and End-of-Life fall under sustainability pillars of Environment (Planet) as well as Economic (Profit). Product design can affect both the sourcing of raw materials as well as the ability to reuse or recycle at product end of life. We agree that this is a material topic but it can be difficult to quantify in a way that is directly comparable between companies and industries.
Fuel Cells & Industrial Batteries	Product Design & End-of-Life Management	Material Issue?	Market Participant	Yes	Product design is critical, as it also defines the environmental consequences of the product.
Fuel Cells & Industrial Batteries	Product Design & End-of-Life Management	Material Issue?	Public Interest & Intermediaries	Maybe	performance is the most critical topic to an investor. Lifecycle issues are important, but not as
Fuel Cells & Industrial Batteries	Product Design & End-of-Life Management	Material Issue?	Public Interest & Intermediaries	Yes	Including a life cycle development approach allows for orderly asset maintenance and replacement. Managing the impact on the environment and also safety issues would be sustainable impacts.





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Fuel Cells & Industrial Batteries	Product Design & End-of-Life Management	Material Issue?	Public Interest & Intermediaries	Yes	Life Cycle Analysis is important for viewing the overall impact of the process – from beginning (mining/extraction) through development, use and finally end-of-life. Many forward-thinking firms are reducing final quantities of material and reusing them in same, or other products. It would be good if research was partially government funded for seeking alternatives.
Fuel Cells & Industrial Batteries	Product Efficiency	Material Issue?	Corporations	Yes	Product efficiency falls under the Sustainability Pillars of Environmental (Planet) as well as Economic (Profit). Fuel efficiency is a significant aspect of our product offering resulting in only trace emissions of pollutants with affordable operating lifecycle costs. We agree that product efficiency is material.
Fuel Cells & Industrial Batteries	Product Efficiency	Material Issue?	Market Participant	Yes	User efficiency renders the largest impact within the product lifecycle.
Fuel Cells & Industrial Batteries	Product Efficiency	Material Issue?	Public Interest & Intermediaries	Yes	Efficiency reflects waste reduction - Lean is a good working example
Fuel Cells & Industrial Batteries	Sensitive & Critical Materials Sourcing	Material Issue?	Corporations	Maybe	<p>This isn't relevant for our Company and some others in the industry as our use of Sensitive &amp; Critical Materials is not material.</p> <p>Disclosure of specific materials used in a battery or fuel cell may provide sensitive and proprietary information to competitors.</p> <p>The use of certain types of inputs can be an investor risk factor though we wonder if this is an appropriate topic for Sustainability?</p>
Fuel Cells & Industrial Batteries	Sensitive & Critical Materials Sourcing	Material Issue?	Market Participant	Yes	It is part of the sustainable supply chain.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Fuel Cells & Industrial Batteries	Sensitive & Critical Materials Sourcing	Material Issue?	Public Interest & Intermediaries	Maybe	lifecycle issues, including sourcing, are important, but not as important as performance
Fuel Cells & Industrial Batteries	Sensitive & Critical Materials Sourcing	Material Issue?	Public Interest & Intermediaries	Maybe	No specific link
Fuel Cells & Industrial Batteries	Sensitive & Critical Materials Sourcing	Material Issue?	Public Interest & Intermediaries	No	This is a measure that would be difficult to cost or audit and be a comparable measure.
Fuel Cells & Industrial Batteries	Sensitive & Critical Materials Sourcing	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	My only concern is really related to the conflict free resourcing, which is not in the scope of this work, but I feel the need to mention it anyway. I note that there are some African countries not included in standard where I know first hand (having lived in West Africa) that conflict gold exists and is sold via various middlement to smelters.
Fuel Cells & Industrial Batteries	Survey comment	Comment on Brief	Corporations	D.N.A. - Comment on Brief	Information provided was good, however was not essential in assisting with answers for the survey.
Fuel Cells & Industrial Batteries	Workforce Health & Safety	Material Issue?	Corporations	Maybe	<p>Health and Safety falls under the Sustainability pillars of 'Social' (People) and Economic (Profit). The welfare of our associates is of paramount importance to the success of the overall business.</p> <p>A pre-commercial fuel cell developer that does not yet have a manufacturing operation may find this metric less material.</p> <p>Using an existing metric that is already measured and reported is important for this topic. The 'DART' rate as submitted annual to OSHA is an option.</p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Fuel Cells & Industrial Batteries	Workforce Health & Safety	Material Issue?	Market Participant	Yes	Due to the extensive use of hazardous materials.
Fuel Cells & Industrial Batteries	Workforce Health & Safety	Material Issue?	Public Interest & Intermediaries	Maybe	Only if manufacturing or processing materials, not if reselling
Fuel Cells & Industrial Batteries	Workforce Health & Safety	Material Issue?	Public Interest & Intermediaries	No	efficiency of the end product (the fuel cell and battery) is most important. Lifecycle and workforce issues may be relevant in the total mix, but for an investor, performance translates far more directly and therefore materially.
Fuel Cells & Industrial Batteries	Workforce Health & Safety	Material Issue?	Public Interest & Intermediaries	Yes	Worker health/safety should, correspondingly, be facilitated with Life Cycle Strategies implementation to reduce overall waste. It is also imperative that workers receive education reflecting not only hazards, but also the need for their reduction and mitigation. In effect, the culture of the entire firm should be current (on board) with this.
Solar Energy	Congratulations	Other Comment	Corporations	D.N.A. - Other Comment	Nice work. I hope my comments are helpful.
Solar Energy	Congratulations	Other Comment	Market Participant	D.N.A. - Other Comment	The research brief was very thorough. Having a Master's in Accounting and working with sustainability issues, I think SASB is doing a great thing in trying to standardize reporting.
Solar Energy	Congratulations	Other Comment	Market Participant	D.N.A. - Other Comment	I find it is a good process, no concerns.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	Cost Reduction to Scale GHG Mitigation	Add Issue	Corporations	Total cost of delivered energy	<p>It's worth noting that the cost of energy transmission is generally more than the cost of generation. While solar is intermittent, adding energy storage can make it dispatchable. A fair apples-to-apples comparison of solar to grid energy would include storage for solar and transmission for centrally generated -- this is a huge blindspot in LCOE arguments, except when doing a direct comparison to retail energy costs to consumers, although these include not only transmission and generation but the utilities' rate of return.</p> <p>Implicit in the comment above is that transmission costs make the fully delivered cost of energy too great in greenfield markets for the grid ever to arrive in markets that can now afford solar. This cost differential affects the attractiveness of solar to grid energy increasingly, as well, as storage becomes cheaper, and points to solar, like cellular phones, leapfrogging centralized architectures permanently where no reliable grid infrastructure is currently in place.</p>
Solar Energy	Cost Reduction to Scale GHG Mitigation	Material Issue?	Corporations	Yes	<p>If solar depends on policy support like RPS targets and, better still, a carbon tax, solar will have to make the case that it's effective at GHG reduction -- and more than just dumb comparisons to trees and cars. But this is meaningless without comparables in other industries. For example, if coal pushes carbon capture, a) its feasibility will have to be proved, and b) the costs of coal with CC will need to be better than solar costs -- only works if everyone is reporting. Negawatts are a good example of misinformation -- one of the California PUC directors said long ago that energy efficiency was cheaper than solar, but while this may be true for a \$5 LED bulb, it may not be true for a \$10 bulb, unless that bulb lasts the 20k hours or 50k hours, as advertised -- which is often not the case. Moreover, solar easily produces more lifetime kWh per dollar than buying a new fridge, AC or oven -- no footnote, one need only look at the cost of these appliances and the energy saved and compare that to the energy produced by solar.</p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	Cost Reduction to Scale GHG Mitigation	Material Issue?	Market Participant	Maybe	This topic will become more important in the future if stricter emission standards are enacted.
Solar Energy	Cost Reduction to Scale GHG Mitigation	Material Issue?	Market Participant	Maybe	Cost reduction to scale GHG mitigation is a very important aspect of increasing the volume and use of solar panels, and I see it as a potential material issue for solar companies, it is their own economic interest. However, I think this is well understood and therefore, while it is important, I don't see it as something that needs to be additionally highlighted as a material (risk) issue, in this context. Solar companies should be fully concentrated on ensuring safe and environmental production processes and lowering cost of solar panel through efficient manufacturing, leading to cost reduction to scale GHG mitigation.
Solar Energy	Cost Reduction to Scale GHG Mitigation	Material Issue?	Market Participant	Maybe	This is one of many factors in a company's success in achieving strong operating margins, and therefore wouldn't rise to the level of a specific disclosure item
Solar Energy	Cost Reduction to Scale GHG Mitigation	Material Issue?	Market Participant	No	<a href="http://www.nrel.gov/news/features/feature_detail.cfm/feature_id=1836">http://www.nrel.gov/news/features/feature_detail.cfm/feature_id=1836</a>
Solar Energy	Cost Reduction to Scale GHG Mitigation	Material Issue?	Market Participant	Yes	Well this is really a competitive issue--any solar company not working on this isn't going to survive. At the same time they can't give away too much sensitive information. I think FSLR and SCTY for example are already doing a pretty good job of this.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	Cost Reduction to Scale GHG Mitigation	Material Issue?	Market Participant	Yes	Cost reduction is huge. If/when solar reaches grid parity, there is expected to be a much bigger migration to the technology. This has been the case in other industries like wireless for example. I would also direct you to an analysis that is on the SEIA website, but is done by Lazard every year on an LCOE basis that would be very helpful for your brief. <a href="https://www.seia.org/sites/default/files/resources/Levelized%20Cost%20of%20Energy%20-%20Version%208.0.pdf#overlay-context=research-resources/lazards-levelized-cost-energy-analysis-v80">https://www.seia.org/sites/default/files/resources/Levelized%20Cost%20of%20Energy%20-%20Version%208.0.pdf#overlay-context=research-resources/lazards-levelized-cost-energy-analysis-v80</a>
Solar Energy	Cost Reduction to Scale GHG Mitigation	Material Issue?	Market Participant	Yes	The greatest competition in the solar industry revolves around who is the low-cost producer. SO not only is it important for the industry to grow but also for each individual company to grow faster than the market.
Solar Energy	Cost Reduction to Scale GHG Mitigation	Material Issue?	Market Participant	Yes	public policy and funding may switch to other energy sources if solar PV GHG mitigation is more costly
Solar Energy	Cost Reduction to Scale GHG Mitigation	Material Issue?	Public Interest & Intermediaries	Maybe	Solar is certainly part of the solution, cost is a factor determined by the market and competitive business strategy. Requiring all solar entities to provide low cost products to scale GHG Reductions may result in cutting corners in other effective areas.
Solar Energy	Cost Reduction to Scale GHG Mitigation	Material Issue?	Public Interest & Intermediaries	Maybe	While GHG mitigation is important, in the grand scheme of things, people are not installing solar to reduce GHG, particularly in the US where climate change is still controversial. If one wants to enter the Florida market, for example, climate change issues are ignored or even mandated to be omitted from government consideration.
Solar Energy	Cost Reduction to Scale GHG Mitigation	Material Issue?	Public Interest & Intermediaries	Yes	<a href="http://files.shareholder.com/downloads/FSLR/4036832138x0xS1274494-15-6/1274494/filing.pdf">http://files.shareholder.com/downloads/FSLR/4036832138x0xS1274494-15-6/1274494/filing.pdf</a> page 25



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	Energy Access	Material Issue?	Corporations	No	<p>Again, sorry, no links. I don't think you can make the argument that it's a solar company's job to improve access to energy for low income consumers in the US. That's the job of policy makers, regulators and utilities, and they are already to a large degree focused on this access, and anyone who works with utilities should be aware of social equity arguments -- solar has been criticized for taking money from low income rate subsidies from the beginning, and it's worth asking these questions. The response was to push costs down to improve energy security and sustainability.</p> <p>You can certainly make the argument that solar companies should be focused on emerging markets and delivering energy to those who don't have any electricity -- this is an incredibly worthwhile social mission -- but solar companies simply by reporting sales and revenue results will be forced to talk about emerging markets with analysts as a measure of their growth potential, so probably this is covered already by plain old investor greed focusing companies on market opportunities.</p>
Solar Energy	Energy Access	Material Issue?	Market Participant	Maybe	<p>Energy access is certainly an important concept for the industry and has the potential to provide top-line growth for certain companies. But, I have reservations because this concept could be applied to any industry with an emerging market presence. I don't know if its necessary to be established as its own disclosure area.</p>
Solar Energy	Energy Access	Material Issue?	Market Participant	Maybe	<p>While access to energy is an important societal topic I'm just not sure how material it is to these companies or how much is under their control. This is part of a company's business plan as it is expanding the addressable market. But I don't expect these companies to be operating in countries where it is still far from profitable for the sake of expanding energy access</p>
Solar Energy	Energy Access	Material Issue?	Market Participant	Maybe	<p>Most manufacturing plants should be located in areas with easy access to power. This would be part of the due diligence in selecting building sites.</p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	Energy Access	Material Issue?	Market Participant	Maybe	The industry is still in its early stages and I am concerned about creating too much of a reporting burden on smaller emerging companies.
Solar Energy	Energy Access	Material Issue?	Market Participant	Maybe	This is one of many factors in a company's success in expanding sales, and therefore wouldn't rise to the level of a specific disclosure item
Solar Energy	Energy Access	Material Issue?	Market Participant	Maybe	While this is an important social topic, companies serving this industry have barriers that may make it difficult to substantially increase access. Additionally, these barriers are not often controlled by the companies that will be reporting this information. Therefore, creating a disclosure item for such a topic, while still relevant and important, is likely not appropriate.
Solar Energy	Energy Access	Material Issue?	Market Participant	No	Supporting low-income users or off-grid applications in developing countries is socially responsible. I'm not sure, though, that it is material for an investor.
Solar Energy	Energy Access	Material Issue?	Market Participant	No	Energy access is a very important aspect of sustainable development, however, I don't see it as a material issue or risk for solar companies themselves, but an issue for governments to solve and manage. Solar companies should be fully concentrated on ensuring safe and environmental production processes and lowering cost of solar panel through efficient manufacturing, leading to improved access.
Solar Energy	Energy Access	Material Issue?	Market Participant	Yes	This is kind of obvious for any sector (which is almost every sector) requiring energy.
Solar Energy	Energy Access	Material Issue?	Market Participant	Yes	Without access to energy, manufacturing will be adversely affected thus affecting revenues.
Solar Energy	Energy Access	Material Issue?	Market Participant	Yes	greater energy access from solar PV undercuts social benefit of competing coal fired electricity
Solar Energy	Energy Access	Material Issue?	Public Interest & Intermediaries	Maybe	Energy Access is vague and needs to be better defined to determine if it is or is not material. Is the access a justice or economic issue? Is access in general to achieve a low carbon electricity system or better rates?
Solar Energy	Energy Access	Material Issue?	Public Interest & Intermediaries	Yes	Off-grid uses and low-income needs globally represent huge markets.





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	Energy Access	Material Issue?	Public Interest & Intermediaries	Yes	No or low access to energy makes production difficult.
Solar Energy	Energy Management in Manufacturing	Material Issue?	Corporations	Maybe	knowing who is the management is very important, but we have to have a limit of who this management is
Solar Energy	Energy Management in Manufacturing	Material Issue?	Corporations	Yes	No link to offer, but in solar, cSi dominates, and the largest constituent in a silicon solar cells is sand. Si is the most plentiful element on earth, after oxides. An investor could argue that the energy content of a solar cell is material bc that energy drives the cost of ingot production, from which wafers then cells are fabricated. Within sustainability circles, you hear the term embodied energy -- for example, aluminum uses or embodies 98 percent less energy when produced from recycled Al as opposed to Al from ore, or so they say. Energy seems material to cost -- although it's worth looking into the full energy of a panel, such as sourcing silicon cheaply and sustainably, or the energy in float glass which is made on a bed of molten tin, and used in solar panels. Further, the information is only useful if you can compare it to energy alternatives like mined coal or nuclear -- LCOE in nuclear never includes a number for fuel disposal, since that's handled by DOE, but if you include it, nuclear becomes the most expensive source of energy (I have no footnote hear, nor are you likely to get a number from DOE, since they still have nowhere to store the fuel for 100k years....)



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	Energy Management in Manufacturing	Material Issue?	Market Participant	Maybe	Understanding the energy payback of solar power and a company's relative energy efficiency are both of material importance. Unfortunately, whilst quantifiable and auditable, a company's total energy consumption doesn't necessarily capture this issue given differing degrees of vertical integration. For example, take a company that only manufactures the solar cell and module in-house. It would report lower total energy consumption per MW than another company that also manufactures the wafer in-house. It would not necessarily be more efficient. Ideally, you need to look at total energy consumed in the overall process but this is harder to quantify or audit. Separately, the percentage of energy sourced from the grid is, in my mind, not particularly relevant for an investor.
Solar Energy	Energy Management in Manufacturing	Material Issue?	Market Participant	Yes	Energy use can be a major expense for solar manufacturers. However, they should be able to use their own products to decrease that cost
Solar Energy	Energy Management in Manufacturing	Material Issue?	Market Participant	Yes	Energy management stands to reduce the production costs and also stands to help the company reduce GHG emissions by reducing consumption.
Solar Energy	Energy Management in Manufacturing	Material Issue?	Market Participant	Yes	I think it's imperative (as you point out in the brief for an industry built on being more efficient/better for the environment to conserve on energy). I was actually surprised that it was only cited as "medium' in the hot spots. If solar was ever perceived as energy intensive, it would lose its social license to operate.
Solar Energy	Energy Management in Manufacturing	Material Issue?	Market Participant	Yes	Electricity, when a large percent of operating costs, is absolutely material.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	Energy Management in Manufacturing	Material Issue?	Market Participant	Yes	The energy payback time varies extensively based on the solar PV technology employed. If the energy payback time is too long, then in a fast growing market, the environmental benefit of that particular solar technology may be more than fully offset by the energy required to manufacture it.
Solar Energy	Energy Management in Manufacturing	Material Issue?	Market Participant	Yes	helps determine energy payback from PV modules
Solar Energy	Energy Management in Manufacturing	Material Issue?	Market Participant	Yes	Energy management is a material issue for a manufacturing company's cost competitiveness
Solar Energy	Energy Management in Manufacturing	Material Issue?	Public Interest & Intermediaries	Yes	excellent energy management is clearly a competitive advantage that could sink/float a company as the industry matures
Solar Energy	Energy Management in Manufacturing	Material Issue?	Public Interest & Intermediaries	Yes	<a href="http://www.resource-solutions.org/pub_pdfs/RECs&amp;OffsetsQ&amp;A.pdf">http://www.resource-solutions.org/pub_pdfs/RECs&amp;OffsetsQ&amp;A.pdf</a> Energy management is material as it relates to efficiency of production, pollution, GHGs and requires companies be distinguished based on their future sustainability with energy (solar included).
Solar Energy	Energy Management in Manufacturing	Material Issue?	Public Interest & Intermediaries	Yes	In case you missed and valid to support what is material here, especially GHG emissions and Hazardous Materials: The SVTC Report was on National Geographic <a href="http://news.nationalgeographic.com/news/energy/2014/11/141111-solar-panel-manufacturing-sustainability-ranking/">http://news.nationalgeographic.com/news/energy/2014/11/141111-solar-panel-manufacturing-sustainability-ranking/</a>
Solar Energy	Energy Management in Manufacturing	Material Issue?	Public Interest & Intermediaries	Yes	Energy mix for manufacturing - substantial reputational risk in NOT getting bulk of energy from solar and/or other renewable.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	Energy Management in Manufacturing	Material Issue?	Public Interest & Intermediaries	Yes	Investors are sensitive to embedded Carbon in the manufacturing process of a solar panel.
Solar Energy	Energy Management in Manufacturing	Material Issue?	Public Interest & Intermediaries	Yes	The amount of energy used to make solar panels is critical to the industry...if it is high, investors need to know especially since this is a renewable industry where people may believe that energy use is low
Solar Energy	Hazardous Materials Management	Material Issue?	Corporations	Yes	Again, you have to start with dollar costs, not a sustainability argument -- Wall Street does not internalize the externalities, so you'll have to do it for them by putting a cost on carbon. Until then, hazardous materials are mostly a matter of bad PR, which affect Goodwill and brand equity on the Balance Sheet, or has implications for lawsuits. Hard to quantify an expected value for lawsuits, but you could go look at past suits and make probability assumptions, or you could look at the cost of insurance and see what it would cost to hedge the risks of a fuel spill, a toxics violation or a bad PR event. For solar, it does matter to the brand, and a law like end of life recycling would also have an effect, but everyone tracks it, they'll eliminate the hazardous constituents eventually, as many panel manufacturers eliminated lead from busbars and ribbon wire.
Solar Energy	Hazardous Materials Management	Material Issue?	Market Participant	Yes	If solar companies are caught inappropriately dumping chemical waste it could tarnish reputations
Solar Energy	Hazardous Materials Management	Material Issue?	Market Participant	Yes	Improper waste management or use of suppliers that improperly dispose of waste can have adverse effects on a company's reputation and stand to reduce its sales.
Solar Energy	Hazardous Materials Management	Material Issue?	Market Participant	Yes	I think this is important for every industry, but I think it is becoming less so with solar. It was a big deal when FSLR first started with cadmium telluride because cadmium is particularly hazardous when exposed. But it's not for any real amount of time (I remember being told by FSLR)--not sure if this accurate.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	Hazardous Materials Management	Material Issue?	Market Participant	Yes	Beyond the obvious benefits of being a good corporate citizen and not polluting the local community, is also risk mitigation that if left unchecked could result in large costs, fines, and negative PR.
Solar Energy	Hazardous Materials Management	Material Issue?	Market Participant	Yes	extra costs from faulty haz materials mgt
Solar Energy	Hazardous Materials Management	Material Issue?	Market Participant	Yes	Mishandling hazmats can result in large liabilities and adverse publicity
Solar Energy	Hazardous Materials Management	Material Issue?	Public Interest & Intermediaries	Yes	too much reputational risk, a lot at stake should this be mishandled,
Solar Energy	Hazardous Materials Management	Material Issue?	Public Interest & Intermediaries	Yes	Expectation that state and national enviro legislation will become more stringent in the face of controversies such as with fracking.
Solar Energy	Hazardous Materials Management	Material Issue?	Public Interest & Intermediaries	Yes	Green investors would not be keen on hazardous materials.
Solar Energy	Ind. Brief comment	Inaccuracy	Market Participant	D.N.A. - Inaccuracy	Not inaccuracy per se but there was a study used form 2010 that talked about costs, I think it would be better to just leave that out as things have changed so dramatically since then.
Solar Energy	Ind. Brief comment	Inaccuracy	Market Participant	D.N.A. - Inaccuracy	The reference to fracking driving down the cost of natural gas by "over 100%" doesn't make sense.
Solar Energy	Ind. Brief comment	Inaccuracy	Market Participant	D.N.A. - Inaccuracy	Page 9: Like any corporation, Yieldcos are taxed twice (and do not avoid double taxation as stated). However, instead of using the tax benefits currently as they are generated (as intended by the Government), they defer the ability to use those benefits, hence losing the time benefit of the subsidy, while providing the illusion of a non-double taxation. Only MLPs can avoid double taxation.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	Ind. Brief comment	Inaccuracy	Market Participant	D.N.A. - Inaccuracy	<p>It was a wonderful brief. I just had one specific comment--Terraform (SunEdison's yieldco) was not the first. It was actually the last of the yieldcos to go public. The first was NRG Yield Co (NYLD) in 2013. If you were mentioning because it was pure solar, I think it's still wrong since NRG not only has a lot of solar, but Terraform acquired First Wind in the Fall of 2014, and is now a major wind operator too. Also, I think some of your pricing information could be updated. I also think that you need to mention something about the President's broader push for renewables, the budget's recommending that the ITC be extended permanently, and the call to repeal fossil fuel subsidies. I don't think anyone expects it all to pass, but it's certainly a step in the right direction, also Obama's agreement with China. These are all big steps for renewables in general, but solar is the most mature and will lead. But it's (the brief) still excellent--you have great sources, good information--and this industry is so dynamic (you have to cut it off somewhere)!</p>



Solar Energy	Ind. Brief comment	Inaccuracy	Market Participant	D.N.A. - Inaccuracy	<p>On page 1, it is not clear that solar thermal is covered, although I assume that CSP = solar thermal as well as concentrated solar PV?</p> <p>Also, one of the main drivers of the reduced cost of solar is that the cost of thin film solar panels (First Solar) has come down based on execution of a technology roadmap which has nothing to do with the declining cost of polysilicon. Even for c-Si panels, a measurable portion of the cost reduction is attributable to manufacturing process changes and other non-polysilicon improvements.</p> <p>Residential solar is typically installed on rooftops, not land, and the non-residential segment (page 2) could simply be called the "commercial and industrial" segment.</p> <p>On page 3, there is also manufacturing in the US (First Solar has 6 lines in Ohio). Also on page 3, the cost of materials is not the top cost for thin film; for thin film it is processing costs (i.e. depreciation of equipment) since the process is highly automated. same is true for the cost of wages which varies by technology as well as by business model (i.e. different for thin film than for c-Si, and different for an installer than for a manufacturer.</p> <p>On page 4, Oil is not used to generate a significant amount of electricity except in Japan and the Middle East, to my knowledge. Diesel is used extensively to generate electricity in emerging markets.</p>
--------------	--------------------	------------	--------------------	---------------------	--



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
					<p>On page 6, I may be mistaken, but I think the ITC simply drops to 10% for all solar PV starting at the beginning of 2017. I do not think it goes to 0% for residential solar. Please check this.</p> <p>On page 8, access to cheaper capital reduces costs for solar energy systems (or projects), not solar energy products.</p> <p>On page 22, it is unfair to compare solar to base load sources of electricity like hydro and wind. It is more fair to compare the LCOE of solar to that of natural gas generation (when employed as peakers), since solar (without a storage solution) is better suited for peak generation.</p>
Solar Energy	Ind. Brief comment	Other Comment	Market Participant	D.N.A. - Other Comment	Glad to see SVTC Solar Scorecard referenced. Boston Common Asset Management has helped support it since its beginning in 2009.
Solar Energy	Ind. Brief comment	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	<p>Other items to consider in "Business Model and Innovation" - whether the company has sought some kind of certification such as becoming a Certified B Corporation or receiving a Green Seal.</p> <p>In HazMat management and Sensitive Materials sourcing - consider processes and inputs based on nature. See Biomimicry 3.8 and Principles of Ethical Biomimicry Finance. Sample company - <a href="http://natcoresolar.com">natcoresolar.com</a></p>
Solar Energy	Industry insights	Add Issue	Market Participant	Integration with utility model	There is a lot of controversy of distributed generation disrupting the regulated utility model. The utility provides a critical service and so a harmonious relationship between the entities I think is really important. How a company is managing its exposure to potential state/local/federal regulations in this area is an important disclosure topic.
Solar Energy	Industry insights	Other Comment	Corporations	D.N.A. - Other Comment	Until the solar energy industry becomes more standardized it will be difficult to audit and not reasonable to compare competitors apples to apples. It is however very important that standards we set are adhered to consistently for auditable outcome.





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	Industry insights	Other Comment	Market Participant	D.N.A. - Other Comment	There is a lot of information presented that provides a point-in-time snapshot of the industry. Unless these research briefs will be continually updated, I would suggest eliminating some of that information so SASB is not playing catch-up to an ever changing industry.
Solar Energy	Industry insights	Other Comment	Market Participant	D.N.A. - Other Comment	<p>I was very impressed by the research brief, and how thorough it was. I thought it was much more comprehensive than the one I reviewed for hotels/cruises in the past. Very impressive.</p> <p>However, I did think you should put in some of the issues with regulatory/incumbent hurdles. It's surprising to read anything on solar without some discussion of the DOE stepchild, Solyndra, the CIGs manufacturer that definitely exemplified an innovation that got crushed when the price of silicon fell; competition is fierce. Incumbents will spin stories, push to keep tax incentives.</p>
Solar Energy	Industry insights	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	One fundamental last thought I have is how to convince stakeholders that battery technologies do not fall within the scope of Solar Energy. Maybe it is better to include it to avoid polemic. It would be great to hear your thoughts as well.
Solar Energy	Industry insights	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	Most of the data is from western countries. With China becoming both the largest solar panel producer and largest polluter, more reliable data from China is essential for the survey to retain its relevance.
Solar Energy	Metric comment	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	I did not understand the relevance of 'nameplate' in 'nameplate capacity produced' referenced on the last question, but put in an answer to be able to continue.
Solar Energy	New Angle	Add Issue	Market Participant	Financial Structuring  [POLITICAL SPENDING & GOVERNMENT SUPPORT]	In the US, government subsidies are massive and are provided as "tax" benefits. That creates potentially meaningful variations in financial and tax structuring of transactions. Moreover, the eligibility to those tax subsidies, as well as the eligible amount, are not clearly defined, allowing significant room for interpretation that is worth disclosing.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	New Issue	Add Issue	Corporations	Power resiliency  [POWER RESILIENCY]	<p>Many customers will pay for solar if it insulates them from power disruptions. Again, batteries and storage need to be included in system cost, as with microgrid applications, and will become more and more attractive as storage becomes cheaper.</p> <p>A central point here is that most additional reporting requirements (eg, Sarbanes-Oxley) are viewed with dread by companies, and SASB would be well served to think of how many of these requirements can help the solar industry and any cleantech business -- ie, if you're going to invest in safer materials or fair trade networks, you'd like those who don't to be held accountable for it to level the playing field. When EPA launched the Energy Star program, they had no idea how successful it would become, essentially as a marketing program and as a sales tool because energy savings could now be quantified for enterprise buyers.</p> <p>Power resiliency, including not only localized self-sufficiency for a homeowner or business in the event of a power crisis, but also for the grid as a totality, may be somehow reportable. For example, a smart inverter could get a resiliency rating like an E-Star rating. Perhaps this is not in SASB's scope with regard to producers like solar panel or inverter makers, and maybe it is better placed on the products for end user comparisons, but on the other hand, if utilities had to report on the resiliency of their grids, it would motivate them to provide incentives for end users to purchase specific and better suited hardware, like smart inverters or battery banks. This may be too narrow for SASB, or maybe it's an ecosystem level issue necessitating broad reporting. For your consideration.</p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	New Issue	Add Issue	Market Participant	environmental impact (and/or water usage)  [DESIGN TO MITIGATE COMMUNITY & ECOLOGICAL IMPACTS] + [WATER MANAGEMENT]	I think there should be requirements to disclose water intensity (water usage) for both manufacturers and developers (i.e. to panels need to be constantly cleaned?).  I also think solar developers should provide discussion and analysis of their environmental impact with respect to water, wildlife, noise, sight lines, etc. for projects under development. Not all countries have strict standards with regards to impact to the local environment from solar development (which may be more applicable for utility scale development).
Solar Energy	New Issue	Add Issue	Market Participant	Impact of regulation/competitive political pressure  [POLITICAL SPENDING & GOVERNMENT SUPPORT]	You touch on it in the brief; however, the uphill battle that solar (and all renewables/alternative) players face in terms of incumbent energy companies who will do what it takes to thwart new players is a real issue. Regulatory/political hurdles are substantial and should attempt to be discussed/potential impact may be hard to quantify. But this will impact investors.
Solar Energy	New Issue	Add Issue	Market Participant	Product end of life management.  [END-OF-LIFE MANAGEMENT]	First Solar several years ago was criticized for use of cadmium in their panels and Japan refused to import them. First Solar offering product end of life management was a response to this concern. Will grow in importance.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	New Issue	Add Issue	Market Participant	Product end-of-life management [END-OF-LIFE MANAGEMENT]	Solar panels contain both hazardous substances, as well as having valuable recyclable materials and while the bulk of panels today still have a long period of effective usage, it is important to lay the groundwork of the WEEE-thinking and "circularity-concepts" early on in this sector. Tightening regulation in this area can be expected. There are also regularly defect panels that will need to be properly handled and the materials recycled.
Solar Energy	New Issue	Add Issue	Market Participant	recycling of spent modules [END-OF-LIFE MANAGEMENT]	industry needs to help build recycling infrastructure - should be part of costs now vs in 20 years
Solar Energy	New Issue	Add Issue	Market Participant	Regulations against solar [POLITICAL SPENDING & GOVERNMENT SUPPORT]	Depending on the political environment, any regulations that limit the use of solar stand to have an impact.
Solar Energy	New Issue	Add Issue	Market Participant	Reliance on Government Subsidies [POLITICAL SPENDING & GOVERNMENT SUPPORT]	As shown in your industry summary, the development of this sector and each participant relies significantly on Government subsidies. Moreover, project developers are not able to use those subsidies the same way, especially in the US. That could create significant competitive advantage or disadvantage that is worth disclosing



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	New Issue	Add Issue	Market Participant	Stakeholder relations [LAND USE & COMMUNITY RELATIONS]	For developers of large scale projects, delays caused by unhappy neighbors can be really expensive and important. So what programs are in place to work with local communities to prevent delays.
Solar Energy	New Issue	Add Issue	Public Interest & Intermediaries	Employment [EMPLOYEE RECRUITMENT, DEVELOPMENT & RETENTION]	The industry is moderately to high labour intensive. It demands, and pays for, high skilled jobs.
Solar Energy	New Issue	Add Issue	Public Interest & Intermediaries	Product End-of-Life [END-OF-LIFE MANAGEMENT]	See your own Watch List, plus the current here in Europe.
Solar Energy	New Issue	Add Issue	Public Interest & Intermediaries	Resilience [POWER RESILIENCY]	Solar energy may support more resilient infrastructures and cities. See Sustainable Development Goals 9 and 11.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	New Issue	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment  [END-OF-LIFE MANAGEMENT]	<p>I do see Product End-of-life management as a material factor in the near future. Including this item in disclosures has the following benefits:</p> <ul style="list-style-type: none"> <li>-It creates awareness which can push innovation towards good design which can include: reducing the amount of toxic materials at end of life as well as the ability to disassemble, reclaim and potentially reuse materials.</li> <li>-While not currently classified as hazardous waste, the regulations have the potential to change. Companies that address this pre-regulatory will benefit.</li> <li>-The electronics industry in general is already making consistent headlines regarding the waste beds in third world countries. The solar industry does not want to lose consumer support or be part of the problem in the future.</li> <li>-Solar industry attention to this issue could reduce risk of future lawsuits, regulations, losing backing of public and gov't</li> <li>-Bring about collaboration within industry to address the issue pro-actively</li> <li>- increase perceived value</li> </ul>
Solar Energy	New Issue	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment  [END-OF-LIFE MANAGEMENT]	<p>I think the end-of-life issue should be given enough weight to add it to the criteria under consideration. This is a concept that is gathering momentum across the electronics and semiconductor industries. Companies that are not leaders on this issue could find themselves at a significant competitive disadvantage in the not-so-distant future.</p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	Sensitive Materials Sourcing	Material Issue?	Corporations	No	I believe that there is a need to know who is sourcing so that we can get information on how good this source or dependable.
Solar Energy	Sensitive Materials Sourcing	Material Issue?	Corporations	Yes	Reporting and transparency are healthy for the industry. Highlighting sensitive materials -- particularly ones sourced in countries hostile to the US or EU -- will help investors judge supply chain risk, as well as help companies make CSR and humanitarian arguments that may be material to brand equity.
Solar Energy	Sensitive Materials Sourcing	Material Issue?	Market Participant	Maybe	In the past, this issue has rarely affected a company's market value. If the materials become difficult to obtain and affect production levels, then that is different. Also, companies are actively working on r&d to replace a number of materials which would diminish this risk.
Solar Energy	Sensitive Materials Sourcing	Material Issue?	Market Participant	Maybe	Companies are already subject to significant disclosure requirements based on existing law. I am, in general, also concerned about creating too much of a reporting and disclosure burden for smaller companies in this emerging industry.
Solar Energy	Sensitive Materials Sourcing	Material Issue?	Market Participant	Maybe	joint industry efforts like with electronics and auto industries can reduce individual company risks in this area
Solar Energy	Sensitive Materials Sourcing	Material Issue?	Market Participant	Yes	The potential for embarrassing reputation damage from getting caught using conflict minerals makes this important
Solar Energy	Sensitive Materials Sourcing	Material Issue?	Market Participant	Yes	Lack of access to materials can have an adverse effect on production and revenues.
Solar Energy	Sensitive Materials Sourcing	Material Issue?	Market Participant	Yes	This is an issue for any sector using sensitive or rare earth elements. Obviously, they need to keep an eye on this area--particularly, since there has been suggestion that China has been accumulating a good amount of REO which could be problematic in terms of accessing inputs down the road.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Solar Energy	Sensitive Materials Sourcing	Material Issue?	Market Participant	Yes	Lack of access to a scarce and crucial input could create a major risk
Solar Energy	Sensitive Materials Sourcing	Material Issue?	Public Interest & Intermediaries	No	It would be difficult to develop a common measure of this factor.
Solar Energy	Sensitive Materials Sourcing	Material Issue?	Public Interest & Intermediaries	No	Green investors would not be that interested.
Solar Energy	Sensitive Materials Sourcing	Material Issue?	Public Interest & Intermediaries	Yes	Solar technologies require a complex supply chain and therefore should not be exempt from sourcing risks
Solar Energy	Sensitive Materials Sourcing	Material Issue?	Public Interest & Intermediaries	Yes	With increase of "values" or "impact" investing, investors are looking to ethically based metrics of which SMS is quantifiable.
Wind Energy	Congratulations	Other Comment	Corporations	D.N.A. - Other Comment	The brief is the most thorough description we have so far seen of the wind energy industry. Very interesting to read.
Wind Energy	Design for Materials Efficiency	Material Issue?	Corporations	Yes	Cost of turbines has a direct impact on site profitability. If the design incorporates more efficient use of materials this could reduce our construction costs.
Wind Energy	Design for Materials Efficiency	Material Issue?	Corporations	Yes	To further increase wind energy's competitiveness, wind turbine manufacturers are required to make further reductions in Levelised cost of energy. Analysts expect that LCOE for wind power will decrease by 10 per cent from 2013 until 2020 and by 20 per cent from 2020 until 2030. Source: Bloomberg New Energy Finance (BNEF): H2 2014 Wind Levelised Cost of Electricity Update. August 2014.  Materials efficiency is one parameter contributing to reduction of Levelised cost of energy.





Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Wind Energy	Design for Materials Efficiency	Material Issue?	Market Participant	Maybe	The weight of materials consumer per MW, while cost effective to get and auditable, doesn't necessarily translate into a more cost effective turbine. For instance, direct drive/gearless turbines tend to be heavier than those using a gearbox but that doesn't make them less competitive. Similarly a blade made using significant amounts of carbon fibre would be lighter but far more expensive than a composite.
Wind Energy	Design for Materials Efficiency	Material Issue?	Public Interest & Intermediaries	Maybe	this one adds a level of complexity too much that will not necessarily enhance proper accounting; rather will make us rely on improbable assumptions.
Wind Energy	Design for Materials Efficiency	Material Issue?	Public Interest & Intermediaries	Yes	Turbines should count design efficiency as material for great production and lower costs.
Wind Energy	Design to Mitigate Community & Ecological Impacts	Material Issue?	Corporations	Yes	Licenses for projects and even corporate loans especially from Equator Banks requires an Environmental and Social Impact Assessment report on the whole life cycle of the project. Some countries may require information on sourcing. Also there are thousands of NGOs and Civil Society groups that monitor energy projects. The environmental and social safeguards guidelines of the banks are those of IFC and World Bank
Wind Energy	Design to Mitigate Community & Ecological Impacts	Material Issue?	Corporations	Yes	As an operator it could impact our ability to generate electricity
Wind Energy	Design to Mitigate Community & Ecological Impacts	Material Issue?	Corporations	Yes	In addition to the community and ecological impacts mentioned in the research brief we can add:  [company-specific links]



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Wind Energy	Design to Mitigate Community & Ecological Impacts	Material Issue?	Public Interest & Intermediaries	Maybe	many of the studies conducted show that the ecological impacts and community impacts of wind are minimal and should not be part of this process.
Wind Energy	Design to Mitigate Community & Ecological Impacts	Material Issue?	Public Interest & Intermediaries	Yes	Community and Ecological Impacts are a defining factor for wind park applications.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Wind Energy	Ind. Brief comment	Inaccuracy	Corporations	D.N.A. - Inaccuracy	<p>On page 19, first paragraph in Evidence it says:</p> <p>'While different turbines designs will have slightly different rations, for [major wind energy company], their direct-drive turbines use about 10 times more rare earth metals than their conventional geared turbines.'</p> <p>In reference 98 we actually write:</p> <p>'The amount of rare earths elements used in direct-drive turbines is substantially higher - up to 10 times as much as a generator in a conventional drive train. Today, all [major wind energy company] turbines are based on proven technology using conventional drive trains.'</p> <p>As [major wind energy company] does not have direct-drive turbines the text in the brief is wrong.</p> <p>On page 21, second paragraph the rising price of tantalum is highlighted as a risk for the margins of Wind turbine manufacturers. We have estimated the amount of tantalum in a turbine to be about 25 grams so the mentioned price increase will be negligible.</p> <p>We have other small comments to the brief and will send them as sticky notes in the brief.</p>
Wind Energy	Ind. Brief comment	Inaccuracy	Market Participant	D.N.A. - Inaccuracy	As with the solar report, reference was made to fracking reducing natural gas prices by over 100%, which doesn't make sense.
Wind Energy	Ind. Brief comment	Inaccuracy	Public Interest & Intermediaries	D.N.A. - Inaccuracy	Page 3 of the Wind Energy IWG Brief: 100% decline in gas price is free gas..(maybe it just needs to be worded differently)..and the n13 link that cites it - the hyperlink is not correct.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Wind Energy	Ind. Brief comment	Inaccuracy	Public Interest & Intermediaries	D.N.A. - Inaccuracy	<p>There is room for improvement. See below for some brief comments. Contact me if you require further support on this matter.</p> <p>Page 1: in the wind turbine classifications don't limit them to 3MW - we already have larger turbines and we will have even larger in the near future.</p> <p>Page 2: Gearless wind turbines have the additional benefit of lower inertia which allows them to kick in at wind speeds of about 2.5m/sec rather than 5m/sec that standard turbines require.</p> <p>Page 3: Mention about fracking is correct but consider adding there the plummeting cost of oil which triggers gas contracts to go down globally and of course intensifies competition for wind energy.</p> <p>Page 3: Electricity demand is not strongly linked to population and certainly reference 15 does not provide evidence for that. There is a host of electricity demand drivers such as the electrification of other sectors (see transportation; domestic and industry), increased efficiency etc. Population is one of them and not really the strongest.</p> <p>Page 7: Among the regulatory measures mention the Contracts for Difference that the UK Government has initiated; they are a variation of FiTs. Their benefits will probably make them popular across Europe.</p> <p>Page 7: The EU has already agreed to cut 40% emissions reductions by 2030.</p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Wind Energy	Industry insights	Inaccuracy	Market Participant	D.N.A. - Inaccuracy	<p>Page 1- I believe companies that develop, build and manage wind energy projects are critical to the development and sustainability of this industry (and not primarily turbine manufacturers).</p> <p>Page 8: Like any corporation, Yieldcos are taxed twice (and do not avoid double taxation as stated). However, instead of using the tax benefits currently as they are generated (as intended by the Government), they defer the ability to use those benefits, hence losing the time benefit of the subsidy, while providing the illusion of a non-double taxation. Only MLPs can avoid double taxation.</p>
Wind Energy	Industry insights	Other Comment	Corporations	D.N.A. - Other Comment	We answered the questions from an Operator and developers perspective. This seemed focused on the manufacturer. We feel strongly that we are a stakeholder in this process. Thank you.



Wind Energy	Metric comment	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	<p>I would like to include the comments CRS provided for SASB's transportation sector:</p> <p>January 2, 2014</p> <p>Submitted electronically via: <a href="mailto:comments@sasb.org">comments@sasb.org</a></p> <p>Regarding: Center for Resource Solutions Comments on Sustainability Accounting Standards Board (SASB) Program for Technology &amp; Communications Sector</p> <p>Background</p> <p>Center for Resource Solutions (CRS) appreciates the opportunity to submit comments on the proposed revisions to TC0101, TC0102, TC0103, TC0201, TC0301 and TC0401. CRS is a 501.c.3 nonprofit organization. CRS creates policy and market solutions to advance sustainable energy, in part through the Green-e Energy consumer protection program. Green-e Energy certifies sales of high-quality renewable electricity and RECs to customers throughout the US and Canada. Nearly three quarters of US retail voluntary renewable electricity and Renewable Energy Certificate (REC) purchases are certified through Green-e Energy. We appreciate SASB's effort to include renewable energy in disclosure guidance and accounting standards and for referencing Green-e.</p> <p>As background to our comments, only through the purchase and use of RECs can any electricity user in the US and Canada accurately claim to be using renewable electricity. A REC represents the non-electricity attributes, including all the environmental attributes, of one megawatt-hour of renewable electricity generation. RECs are the means to track generation and consumption of renewable electricity, because the sources of electricity put onto the grid cannot physically be tracked through individual electrons; some form of contractual accounting must be used for such tracking, and this is accomplished through RECs.</p>



					<p>RECs may be bought and sold independent of electricity, or bundled with electricity purchased through a renewable power purchase agreement (PPAs) or voluntary renewable electricity program offered by an electric service provider or utility. Likewise, on-site generation facilities generate electricity and RECs. In all cases, the REC is the way to track and account for the fact that the electricity generation was renewable, and also make the claim of using renewable electricity from the generating facility.</p> <p>Our comments are applicable to all SASB standards that reference renewable energy use by reporting entities, and we hope that SASB will consider these comments and issues during the development and revision of all SASB standards.</p> <p><b>Renewable PPAs and On-Site Generation Must Include RECs</b></p> <p>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 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.</p> <p><b>Add Reference to Voluntary Renewable Electricity Programs</b></p> <p>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</p>
--	--	--	--	--	--



				<p>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.</p> <p>Distinguish between Electricity and Energy,</p> <p>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.</p> <p>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 is measured in MWh, and so the registrants' calculations will be simplified with this clarification.</p> <p>Distinguish between Renewable and Non-renewable Electricity Sources</p> <p>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</p>
--	--	--	--	--





				<p>of the electricity they purchase that is not specifically renewable.</p> <p>Appropriate Reference to Green-e Energy Certification</p> <p>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.</p> <p>Suggested Language</p> <p>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 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.”</p> <p>RECs Should Be Applied to Scope 2 Emissions Only</p> <p>Finally, CRS supports the inclusion of emissions from purchased electricity use (scope 2 emissions) to the proposed disclosure for the</p>
--	--	--	--	---



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
					<p>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.</p> <p>Please feel free to contact us with any questions you may have on these comments or if we can be of any further assistance to you on electricity and greenhouse gas accounting in SASB standards. We have worked closely with the US Green Building Council on the renewable electricity and carbon offset portions of their LEED standards, and have provided support to other standards such as Cradle to Cradle and Green Seal around the same issues, and we would be happy to assist SASB as well. We can be reached at 415-561-2100 and <a href="mailto:energy@green-e.org">energy@green-e.org</a>.</p> <p>Thank you,</p> <p>Michael Leschke</p> <p>Green-e Energy Associate</p> <p>Center for Resource Solutions</p> <p>I would also like to include this link to our best practices in renewable energy claims for Wind:</p> <p><a href="http://www.resource-solutions.org/pub_pdfs/Guidelines%20for%20Renewable%20Energy%20Claims.pdf">http://www.resource-solutions.org/pub_pdfs/Guidelines%20for%20Renewable%20Energy%20Claims.pdf</a></p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Wind Energy	Metric comment	Other Comment	Public Interest & Intermediaries	D.N.A. - Other Comment	<p>The material sustainability topics and the accounting metrics presented for the wind energy industry are well structured in my point of view. The only caveat concerns the proposed qualitative indicators (albeit qualitative indicators will always be exposed to discussion).</p> <p>In some cases, especially for the accounting metrics in which metrics are qualitative, to compare information from different companies will be difficult, because the information reported will be basically a description of practices and initiatives, such as programs, projects, cases, etc., deployed and, because of that, depending on the company, different types of indicators (risk or performance) could be presented. Therefore, not always an information from a company will be comparable to other one and maybe it will not keep relation with the theme presented.</p>
Wind Energy	New Angle	Inaccuracy	Public Interest & Intermediaries	D.N.A. - Inaccuracy  [DESIGN TO MITIGATE COMMUNITY & ECOLOGICAL IMPACTS]	<p>Page 11 refers to the "extraction" of steel. It might be better phrased to talk about the production of steel and the extraction of iron ore and other precursors.</p> <p>Also, the discussion of community impacts on pages 12-13 is solely focused on noise and biological impacts, while visual shadow flicker impacts have also been raised in the majority of cases where a community opposes windpower.</p>
Wind Energy	New Angle	Other Comment	Corporations	D.N.A. - Other Comment  [DESIGN TO MITIGATE COMMUNITY & ECOLOGICAL IMPACTS]	<p>I suggest we expand the discussion on environmental impacts that must be considered by the designer of turbines like wildlife deaths and vista. Maybe if more research is available on the matter, these will guide the manufacturers better.</p>



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Wind Energy	New Issue	Add Issue	Corporations	Safety  [HEALTH AND SAFETY]	In 2012 [major wind energy company] conducted a materiality assessment with selected stakeholders. Six key account customers gave Health & safety an overall rating of 97 out 100 making Health and safety the most material issue. As one customer commented: Expected from suppliers now. Not a competitive advantage but a “must have”
Wind Energy	New Issue	Add Issue	Market Participant	Financial Structuring  [POLITICAL SPENDING & GOVERNMENT SUPPORT]	In the US, government subsidies are massive and are provided as “tax” benefits. That creates potentially meaningful variations in financial and tax structuring of transactions. Moreover, the eligibility to those tax subsidies is not clearly defined, allowing significant room for interpretation that is worth disclosing.
Wind Energy	New Issue	Add Issue	Market Participant	Reliance on Government Subsidies  [POLITICAL SPENDING & GOVERNMENT SUPPORT]	As shown in your industry summary, the development of this sector and each participant relies significantly on Government subsidies. Moreover, project developers are not able to use those subsidies the same way, especially in the US. That could create significant competitive advantage or disadvantage that is worth disclosing
Wind Energy	New Issue	Add Issue	Public Interest & Intermediaries	Design for Increased Output Efficiency  [PRODUCT EFFICIENCY]	Product innovation should target not just efficient use of materials, but also specific technology improvements to allow for greater power output for the same wind speed.



Industry	Mapping to SASB Topic	Survey Category	Stakeholder Type	Suggested Topic / Response	Comment
Wind Energy	New Issue	Add Issue	Public Interest & Intermediaries	Product Design End-of-Life Management  [END-OF-LIFE MANAGEMENT]	Wind turbines have a finite lifetime, especially as the technology advances. There have not been many large windfarms decommissioned, but this will happen increasingly, and manufacturers would create benefits by anticipating that and incorporating design aspects that facilitate recycling of materials, for instance.
Wind Energy	SASB Approach	Other Comment	Market Participant	D.N.A. - Other Comment	process seems to be less comprehensive than the paper/forestry one.
Wind Energy	Sensitive & Critical Materials Sourcing	Material Issue?	Corporations	Maybe	A definition of critical materials is missing.
Wind Energy	Sensitive & Critical Materials Sourcing	Material Issue?	Corporations	Yes	There are some international advocates that not only publish reports in the internet but can actually file cases against manufacturers.
Wind Energy	Sensitive & Critical Materials Sourcing	Material Issue?	Corporations	Yes	If there is a scarcity of key materials required, this would significantly impact the costs of a project.
Wind Energy	Sensitive & Critical Materials Sourcing	Material Issue?	Public Interest & Intermediaries	Yes	For a selection of sensitive and critical materials this is a useful exercise.
Wind Energy	Sensitive & Critical Materials Sourcing	Material Issue?	Public Interest & Intermediaries	Yes	As with other renewable resources, wind should include sensitive and critical materials sourcing as material for industry sustainability, risk and ethics.