



**Accounting for a  
Sustainable Future™**

# ELECTRICAL & ELECTRONIC EQUIPMENT

## Research Brief

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# ELECTRICAL & ELECTRONIC EQUIPMENT

## Research Brief

SASB's Industry Brief provides evidence for the material sustainability issues in the Electrical Equipment industry. The brief opens with a summary of the industry, including relevant legislative and regulatory trends and sustainability risks and opportunities. Following this, evidence for each material sustainability issue (in the categories of Environment, Social Capital, Human Capital, Business Model and Innovation, and Leadership and Governance) is presented. SASB's Industry Brief can be used to understand the data underlying SASB Sustainability Accounting Standards. For accounting metrics and disclosure guidance, please see SASB's Sustainability Accounting Standards. For information about the legal basis for SASB and SASB's standards development process, please see the Conceptual Framework.

SASB identifies the minimum set of sustainability issues likely to be material for companies within a given industry. However, the final determination of materiality is the onus of the company.

### Related Documents

- [Electrical & Electronic Equipment Sustainability Accounting Standard](#)
- [Industry Working Group Participants](#)
- [SASB Conceptual Framework](#)

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## SUSTAINABILITY DISCLOSURE TOPICS

### ENVIRONMENT

- Energy Management
- Hazardous Waste Management

### SOCIAL CAPITAL

- Product Safety

### BUSINESS MODEL AND INNOVATION

- Product Lifecycle Management & Innovation for Environmental Efficiency

### LEADERSHIP AND GOVERNANCE

- Business Ethics & Competitive Behavior
- Materials Sourcing

opportunities for companies in this industry that are focused on automation, safety, product innovation, and resource efficiency. Stakeholders are demanding more energy-efficient and safe products to meet their own progressively stringent needs. Business ethics in companies' own operations and supply chains will also play an increasingly important role in determining license to operate and eligibility for contracts, particularly as exposure to emerging markets and the associated risks of overseas business become more prevalent.<sup>1</sup>

Management (or mismanagement) of material sustainability issues, therefore, has the potential to affect company valuation through impacts on profits, assets, liabilities, and cost of capital.

Investors obtain a more holistic and comparable view of performance with electrical and electronic equipment companies reporting metrics on the material sustainability risks and opportunities that could affect value in the near- and long-term in their regulatory filings. This would include both positive and negative externalities, and the non-financial forms of capital that the industry relies on for value creation.

Specifically, the sustainability issues that will drive competitiveness within the Electrical & Electronic Equipment industry include:

- Improving energy management in operations, which can lead to cost savings;
- Managing hazardous waste in production;
- Ensuring the safety of products;
- Reducing product lifecycle impacts and innovating to address use-phase

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## INTRODUCTION

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Products from the Electrical & Electronic Equipment industry enable a wide range of technologies and will continue to be an important element in meeting global market demands for a variety of industries and applications, including power generation, transportation, automation, heating and cooling, lighting, and transmission cables.

Given its resource intensity and significant environmental externalities, the Electrical & Electronic Equipment industry is increasingly impacted by emerging environmental threats, such as climate change and constrained resources. Together with rising public concern about the environmental and health impacts of industrial production, these threats are intensifying regulatory and customer pressure on electrical and electronic equipment manufacturers to improve their sustainability performance. Emerging trends are providing

efficiency and end-of-life management issues in order to capture market demand;

- Upholding business ethics and avoiding bribery and price manipulation in the market; and
- Managing exposure to conflict and rare earth minerals in the supply chain.

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## INDUSTRY SUMMARY

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The Electrical & Electronic Equipment industry includes companies that develop and manufacture a broad range of electrical and electronic equipment and components. These include: non-structural commercial and residential building equipment, such as heating, ventilation, and air conditioning (HVAC) systems, lighting fixtures, security devices, and elevators; electrical power equipment, including traditional power generation and transmission equipment and renewable energy equipment; industrial automation controls; measurement instruments; and electrical components used for industrial purposes, including coils, wires, and cables.<sup>1</sup>

Companies in the Electrical & Electronic Equipment industry generated combined revenues of about \$1.04 trillion globally according to reported fiscal-year revenues as of January 13, 2015.<sup>2</sup> Companies primarily engaged in the Electrical & Electronic Equipment industry that are publicly traded on U.S. exchanges generated approximately \$209 billion in global revenues from this industry in fiscal year (FY) 2013.<sup>3</sup> Some representative U.S.-listed companies across the different industry segments include Honeywell, ABB,

General Electric, Emerson Electric, and Rockwell Automation. Four of these companies are domiciled in the U.S., while ABB is headquartered in Switzerland.

Companies in this industry operate globally and generate a significant portion of their revenue from outside the country of their domicile. For example, in 2012, Emerson Electric generated 55 percent of its revenue outside the U.S.<sup>4</sup> Conversely, Siemens AG, a German company traded over the counter in the U.S., generated \$16.7 billion, or around 21 percent, of its revenue in the U.S. in 2012.<sup>5</sup> In the U.S., domestic electrical equipment manufacturers have been facing significant pressure from overseas competitors as imports increase. Imports were expected to satisfy 61 percent of domestic demand in 2014.<sup>6</sup> However, competition from foreign imports is slightly offset by increasing exports from domestic industry players. Despite the fact that the U.S. is a net importer of electrical and electronic equipment, exports have grown 14.8 percent annually over the five years leading up to 2014.<sup>7</sup>

Key drivers of demand for the industry include construction activity, manufacturing activity, and electric power consumption.<sup>8</sup> The primary customers for electrical and electronic equipment companies are industries involved in non-residential construction and manufacturing.<sup>9</sup> Building construction and general contracting are major sources of revenue for the Electrical & Electronic Equipment industry as they use large amounts of switchboards, HVAC equipment, and lighting. Manufacturing facilities also require various electrical components, including

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<sup>1</sup> Industry composition is based on the mapping of the Sustainable Industry Classification System (SICS™) to the

Bloomberg Industry Classification System (BICS). A list of representative companies appears in Appendix I.

automation control systems and electric motors, among others.

This industry is highly cyclical—as a result of the recession, industry revenue dropped significantly in 2009 as the rate of non-residential construction fell drastically, and manufacturing operations stalled, thus reducing demand from key consumers.<sup>10</sup> Net profit margins also dipped during the recession to around five percent and have since recovered to average pre-recession levels of 9.2 percent in 2014 for the five representative companies. The margins ranged from 6.7 percent to 11.9 percent across the five companies in 2014.<sup>11</sup>

Companies' costs vary depending upon the extent of outsourcing or offshoring, technological efficiencies, company size, and markets. Costs of materials (including steel, copper, aluminum, and plastics, among others) and fabricated product inputs as well as electronic components are the largest costs for the industry, at around 45.5 percent of industry revenue. Profit margins are also affected by relatively higher wages compared to other manufacturing industries for higher-skilled labor requirements (at around 15 to 16 percent of revenue), as well as costs for shipping and distribution of heavy products.<sup>12</sup>

Domestic industry players face increasing pressure on margins as they continue to compete with imports from foreign operators with lower costs of production, especially in Europe, where the economy is still weak.<sup>13; 14</sup> While improvements in the overall economy have helped to improve industry margins over the past five years, companies were also forced to seek additional opportunities such as improving manufacturing efficiencies, selling

higher-margin products, and moving production plants overseas to maintain profitability.<sup>15</sup> For Example, Eaton Corporation chose to reduce its workforce by 17 percent and increase automation within its manufacturing processes.<sup>16</sup> Companies in this industry will need to continue to be cost-conscious and drive product innovation in order to meet market needs at a price point that is competitive with imports and offshoring operations.

New entrants may face barriers to entry because establishing and operating electrical and electronic equipment manufacturing is capital intensive.<sup>17</sup> The domestic Electrical & Electronic Equipment industry has traditionally not been very concentrated, although the trend is shifting toward higher levels of concentration. Consolidation is largely a result of lower demand in the U.S. and increased pricing pressure from international production.<sup>18</sup>

Eaton Corporation acquired Cooper Industries, a large electrical equipment supplier located in Ireland, in a deal worth \$13 billion in 2012.<sup>19</sup> Emerson Electric acquired U.K.-based Chloride Group PLC, a provider of critical power solutions used in computing markets, for \$1.5 billion.<sup>20</sup> Other large foreign operators ABB and Siemens AG have also acquired large U.S.-based companies over the past several years.<sup>21</sup> Industry contraction is also pushing U.S. and global players to expand their international presence, especially to capitalize on the growth opportunities from expanding infrastructure in China and emerging markets.<sup>22</sup> The Electrical & Electronic Equipment industry is characterized by a large and highly complex supply chain, as many of these companies compete globally and source both labor and materials from all over

the world. Some large industry players have shifted their operations to low-cost countries to save on costs associated with materials, manufacturing, and engineering and development.<sup>23</sup> This complexity makes it more challenging for companies to manage regulatory and sustainability trends.<sup>24</sup> However, in addition to lowering costs, increasing production presence in low-cost countries will allow companies to better understand and meet the growing product needs in emerging markets.<sup>25</sup>

The Electrical & Electronic Equipment industry is expected to benefit from increasing demand for more energy-efficient products and government focus on spending to replace an aging electric infrastructure in developed countries.<sup>26</sup> As concerns over climate change and limited resources become more prevalent, consumers are becoming increasingly conscious of their electricity usage. For example, growing industrial production in Japan and the shift away from nuclear power is expected to drive strong demand for electrical and electronic equipment.<sup>27</sup>

According to industry analysts, companies with global operations, access to high-quality inputs and expertise, and effective adoption of quality control and the latest technologies will be best poised for success in this industry.<sup>28</sup> Analysts also note that companies that prioritize product research and development (R&D) and reduce their time-to-market cycles will gain and retain market share.<sup>29</sup>

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## LEGISLATIVE AND REGULATORY TRENDS IN THE ELECTRICAL & ELECTRONIC EQUIPMENT INDUSTRY

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Regulations in the U.S. and abroad represent the formal boundaries of companies' operations, and are often designed to address the social and environmental externalities that businesses can create. Beyond formal regulation, industry practices and self-regulatory efforts act like quasi-regulation and also form part of the social contract between business and society. In this section, SASB provides a brief summary of key regulations and legislative efforts related to this industry, focusing on social and environmental factors. SASB also describes self-regulatory efforts on the part of the industry, which could serve to preempt further regulation.<sup>11</sup> Legislation discussed within this section relating to materials inputs, energy efficiency, and conflict minerals has the potential to further emphasize the importance of reporting on and performing well with respect to material sustainability issues.

As traditional manufacturers, electrical equipment companies must comply with various environmental health and safety (EHS) regulations that affect all manufacturers, such as the Clean Water Act, the Water Safety Act, Occupational Safety and Health Administration (OSHA) standards, and other Environmental Protection Agency (EPA) regulations. Since a significant proportion of industry products is sold or manufactured overseas, EHS laws in other countries are likely to affect company financials. For example, article 75 of France's

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<sup>11</sup> This section does not purport to contain a comprehensive review of all regulations related to this industry, but is

intended to highlight some ways in which regulatory trends are impacting the industry.

Grenelle II Act (2011) makes it mandatory for companies with more than 500 employees to disclose scope 1 and 2 GHG emissions every three years.<sup>30</sup>

The impact on human and environmental health of specific chemicals commonly found in electrical and electronic products has also been the source of current regulatory scrutiny and emerging regulatory efforts. In the U.S., concern over electronic waste (e-waste) has led to the introduction of several pieces of legislation in Congress. Although these efforts fall short of a federal framework, regulation is widely expected in the coming years.<sup>31</sup>

Meanwhile, electrical and electronic equipment companies may be required to comply with various state regulations concerning the handling of electronics equipment during the manufacturing and end-of-life stages. Currently, almost half of all states have laws in place relating to the proper disposal of consumer e-waste. For example, California passed the Electronic Waste Recycling Act in 2003, which includes guidance on hazardous substances and the collection of e-waste like TVs, printers, and batteries.<sup>32</sup> While many of these laws cover consumer products, they may also be adopted for commercial electrical products in the future.

Furthermore, there is currently more stringent regulation in other jurisdictions for chemicals in products and the end-of-life management of products. The European Union (E.U.)'s Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) framework and Restriction of Hazardous Substances in electrical and electronic equipment (RoHS) directive are currently the most stringent frameworks for the management of chemicals

used in the Electrical & Electronic Equipment industry. The RoHS directive was enacted in 2004 to set limits on the use of hazardous chemicals in electrical products, with the exception of some exclusions for large-scale fixed installations. RoHS 2 was enacted in 2013, expanding the product segments reported on in RoHS and includes additional electrical and electronic equipment segments. New products marketed in the E.U. have concentration limits for a number of substances that have detrimental effects on human and environmental health, including lead, hexavalent chromium, cadmium, mercury, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDEs).<sup>33; 34</sup> Other toxic substances such as brominated flame retardants (BFRs) and polyvinyl chloride (PVC) are expected to be regulated in the coming years.<sup>35</sup>

In addition, the European Waste Electrical and Electronic Equipment (WEEE) directive sets collection targets and makes the producers of equipment financially liable for the collection, treatment, recycling, and safe disposal of electrical products, which may contain hazardous substances.<sup>36</sup>

Similar laws restricting hazardous substances in products and governing e-waste have been implemented in China, Japan, and other countries where electrical and electronic equipment manufacturing or sales occur.

In addition to hazardous substances regulations, legislation related to product energy-efficiency, such as the E.U.'s Ecodesign Directive for energy-related products, could affect sales in the E.U.<sup>37</sup> Voluntary programs like ENERGY STAR of the U.S. EPA are also

setting standards and driving demand for energy-efficient products.<sup>38</sup>

Due to their use of hazardous chemicals in production, industry participants have been subject to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund laws in the U.S. Spills or releases of toxic substances that occur in operations can result in significant fines and remedial charges under CERCLA.<sup>39</sup>

The electrical and electronic equipment industry also sources raw materials such as rare earth minerals and “conflict minerals,” the production of which could fuel armed conflict, and both are subject to regulatory scrutiny. The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 and subsequent rules adopted by the U.S. Securities and Exchange Commission (SEC) require companies to publicly disclose their use of “conflict minerals” if they are “necessary to the functionality or production of a product” that the company manufactures or contracts to be manufactured. These minerals include tantalum, tin, gold, and tungsten (3TG) originating in the Democratic Republic of Congo (DRC) or adjoining countries. Specifically, the provision requires SEC-registered companies to determine if they have exposure to DRC-sourced 3TG, and 3TG minerals are commonly used in the Electrical & Electronic Equipment industry, among others. Companies with exposure to DRC-sourced 3TG must subsequently determine and report on the specific source.<sup>40</sup> The rules, which required companies to make their first filings effectively by June 2014, have been upheld by the U.S. District Court for the District of Columbia, despite a legal challenge from trade associations.<sup>41</sup>

Newly proposed legislation and existing regulations and standards are expected to drive demand for more energy-efficient products used in residential, commercial, industrial, and federal sectors, impacting nearly every major company in the Electrical & Electronic Equipment industry. Acts that were previously implemented, such as the Energy Independence and Security Act of 2007, set standards for various types of electrical equipment, such as lighting and motors.<sup>42</sup> EPA certifications like Energy Star are also shifting the industry toward adapting products to meet strict energy-efficiency standards.<sup>43</sup> More recently, the Energy Savings and Industrial Competitiveness Act was introduced in 2013-14 and is aimed at spurring the use of new energy-efficient technology to help businesses and consumers save money, while also reducing carbon emissions throughout the economy.<sup>44</sup>

Laws and regulations surrounding antitrust and anti-bribery measures are also applicable to electrical equipment companies and can be sources of significant fines if violations are found. As this industry continues to consolidate and cut costs via offshoring of operations and expansion into emerging markets, there is greater exposure to risk related to governance issues. Laws related to corruption and antitrust practices include provisions such as the U.S. Sherman Antitrust Act, the Clayton Act, and the Federal Trade Commission Act. The Foreign Corrupt Practices Act (FCPA) and other government regulations also ban the use of bribes in overseas markets in which companies operate.

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## SUSTAINABILITY-RELATED RISKS AND OPPORTUNITIES

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Industry drivers and recent regulations suggest that traditional value drivers will continue to impact financial performance. However, intangible assets such as social, human, and environmental capitals, company leadership and governance, and the company's ability to innovate to address these issues are likely to increasingly contribute to financial and business value.

Broad industry trends and characteristics are driving the importance of sustainability performance in the Electrical & Electronic Equipment industry:

- **Environmental and social externalities from manufacturing and products:** The industry can create environmental externalities as a result of its production process, through the use and improper disposal of hazardous and toxic chemicals as well as from electricity consumption, which can indirectly contribute to GHG emissions. Social externalities can also result from safety risks and hazards in product use. Electrical products that contain hazardous materials can lead to negative human health and safety impacts during use and at the end-of-life. Innovations to reduce such externalities can provide companies with a competitive advantage in the face of more stringent regulations and customer demand for higher environmental and social standards in production and products.

- **Energy efficiency:** Customers' energy and emission-reduction needs, combined with pressure from new legislation, are driving the demand for more energy-efficient products and shaping the product landscape.
- **Use of sensitive and critical materials:** The industry relies on key raw materials, including rare earth elements and conflict minerals, whose sourcing is increasingly regulated and constrained due to environmental and sociopolitical factors. This is driving shifts in product lifecycle management, sourcing, and supply chain management decisions, which are important for mitigating supply disruptions and price volatility for these key inputs.

The following section provides a brief description of each sustainability issue that is likely to have material implications for companies in the Electrical & Electronic Equipment industry. This includes an explanation of how the issue could impact valuation and evidence of actual financial impact. Further information on the nature of the value impact, based on SASB's research and analysis, is provided in Appendix IIA and IIB.

Appendix IIA also provides a summary of the evidence of investor interest in the issues. This is based on a systematic analysis of companies' 10-K and 20-F filings, shareholder resolutions, and other public documents, which highlights the frequency with which each topic is discussed in these documents. The evidence of interest is also based on the results of consultation with experts participating in an industry working group (IWG) convened by SASB. The IWG results represent the

perspective of a balanced group of stakeholders, including corporations, investors or market participants, and public interest intermediaries.

The industry-specific sustainability disclosure topics and metrics identified in this brief are the result of a year-long standards development process, which takes into account the aforementioned evidence of interest, evidence of financial impact discussed in detail in this brief, inputs from a 90-day public comment period, and additional inputs from conversations with industry or issue experts.

A summary of the recommended disclosure framework and accounting metrics appears in Appendix III. The complete SASB standards for the industry, including technical protocols, can be downloaded from [www.sasb.org](http://www.sasb.org). Finally, Appendix IV provides an analysis of the quality of current disclosure on these issues in SEC filings by the leading companies in the industry.

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## ENVIRONMENT

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The environmental dimension of sustainability includes corporate impacts on the environment. This could be through the use of natural resources as inputs to the factors of production (e.g., water, minerals, ecosystems, and biodiversity) or environmental externalities and harmful releases in the environment, such as air and water pollution, waste disposal, and GHG emissions.

The Electrical & Electronic Equipment industry depends on energy as an input to production, primarily in the form of purchased electricity. Fossil fuel extraction and the generation of electricity at utilities can be associated with environmental externalities including GHG

emissions, air and water pollution, and biodiversity loss. As global demand for energy increases and legislation seeks to address environmental externalities, the price and supply of energy resources can become volatile.

At the same time, the equipment manufacturing process can generate direct environmental impacts if hazardous waste is inadequately managed. Regulations can impose costs for managing such waste and dealing with the consequences of its environmental and human health impacts.

Therefore, equipment manufacturers' electricity use and hazardous waste generation can affect company valuation through impacts on operating efficiency and the cost of capital. However, the industry's direct GHG emissions from manufacturing are relatively low, and thus are not likely to present a material risk.

Furthermore, materials sourcing and product use also entail environmental and social impacts, which could affect company value. These are addressed below in the Product Lifecycle Management & Innovation for Environmental Efficiency and Materials Sourcing topics under the Business Model and Innovation and Leadership and Governance sections, respectively.

## Energy Management

Energy is a critical input in electrical and electronic equipment manufacturing, with the costs of purchased electricity typically being more significant than costs associated with on-site fuel combustion.

Fossil fuel and electrical energy consumption can contribute to environmental impacts,

including climate change and pollution. These impacts have the potential to indirectly affect the results of operations of electrical and electronic equipment companies. Sustainability factors—such as increasing GHG emission regulation, incentives for energy efficiency and renewable energy, and risks associated with nuclear energy and its increasingly limited license to operate—are leading to increases and volatility in the price of conventional electricity sources while making alternative sources cost-competitive. Therefore, it is becoming increasingly important for companies to manage their overall energy efficiency, their reliance on different types of energy and the associated risks, and their access to alternative energy sources.

In this context, electrical and electronic equipment manufacturers can benefit from initiatives aimed at reducing energy usage. Companies can also choose to source or generate power on-site through renewable energy or alternative generation sources such as fuel cells. They can implement more efficient closed-loop processes to make better use of waste materials and/or take advantage of excess heating or cooling to reduce the need for additional energy generation. This can reduce companies' dependence on electricity purchased from the grid.

By properly managing their energy footprint, equipment manufacturers can be better prepared to withstand volatile energy prices and constraints in the supply of electricity, which is an essential input in a company's operations. Companies implementing energy

solutions into their own operations can have the added benefit of showcasing energy-efficiency solutions to their customers.

Company performance in this area can be analyzed in a cost-beneficial way internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Total energy consumed, percentage grid electricity, percentage renewable.

## Evidence

GHG emissions from the Electrical & Electronic Equipment industry mainly come in the form of indirect (scope 2) emissions through electricity usage.<sup>45</sup> Energy is critical for value creation in the industry. Energy costs, particularly related to purchased electricity,<sup>46</sup> are an important share of overall costs for equipment manufacturers. According to the U.S. Census Bureau's 2011 Annual Survey of Manufacturers (ASM), the total electricity purchased for heat and power for this industry was approximately 11.3 billion kWh, which was around 1.4 percent of the total across all manufacturing industries in the U.S.<sup>47</sup> The cost of purchased electricity for the industry represents approximately 1.3 percent of its total cost of materials, close to that of all manufacturing industries combined, for which the purchased electricity cost is approximately 1.6 percent of total costs of materials.<sup>48</sup>

Global manufacturing energy costs may be higher, with companies' offshoring production to emerging markets, where energy costs are typically high and energy supply can be

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<sup>45</sup> This industry is represented primarily by the following classifications from the 2007 North American Industry Classification System (NAICS), on which ASM data is based: HVAC (NAICS 3334), Electric Lighting (NAICS

3351), Electrical Equipment (NAICS 3353), and other communication, wiring and cable manufacturing (NAICS 33592, 33593, and 33599).

unreliable.<sup>49</sup> According to Emerson Electric CEO David Farr, energy is typically among the largest costs at global manufacturing facilities.<sup>50</sup>

Electricity costs have increased and are expected to continue to rise in the future, particularly in markets outside the U.S. The Boston Consulting Group estimates in its report on manufacturing cost competitiveness that energy costs, including industrial electricity prices, in countries outside North America were between 50 to 200 percent higher in 2014 than they were in 2004.<sup>51</sup> Electricity prices for industrial customers in the U.S. are expected to increase as well, according to Bloomberg New Energy Finance calculations, which show retail power prices at \$70 per megawatt-hour (MWh) for industrial users in 2013. These prices are expected to increase to \$76 per MWh in 2025 and \$82 per MWh in 2035 (all costs in real 2015 U.S. dollars).<sup>52</sup> Companies in the industry recognize the risks of rising energy costs. TE Connectivity noted in its Form 10-K for FY2014 that laws regulating GHG emissions are likely to increase the company's costs for energy and certain materials and products.<sup>53</sup>

Furthermore, equipment manufacturers can face volatility in energy costs, affecting the results of operations. For example, General Cable Corporation noted in its Form 10-K for FY2013 that “[v]olatility in the price of copper and aluminum and other raw materials, as well as fuel and energy, may in turn lead to significant fluctuations in our cost of sales or revenues.”<sup>54</sup>

SASB's analysis of the frequency with which this topic is discussed in various source documents, including company SEC filings, (see column on SASB's Heat Map in Appendix IIA) indicates that overall the topic is in the top

quartile of topics for this industry. Furthermore, 85 percent of experts in SASB's industry working group indicated the topic is likely to constitute material information for companies in the industry.

Since energy represents a significant cost for electrical equipment manufacturers, there is an opportunity for them to benefit from improving energy efficiency throughout their facilities. Large electrical equipment manufacturers are implementing energy management systems into their operations, ultimately reducing costs and indirect emissions from operations. Schneider Electric, a large multinational electrical equipment manufacturer headquartered in France, set a goal to reduce its CO<sub>2</sub> emissions from energy consumption (and other sources) by 15 percent between 2009 and 2011.<sup>55</sup> The company has implemented various initiatives to reduce its consumption of electricity, natural gas, and oil, ultimately reducing costs. Improvements in HVAC, air compressors, and lighting have helped contribute to a reduction in the company's overall use of energy.<sup>56</sup> These energy-efficiency solutions also allow Schneider to showcase its own energy-efficiency products and solutions to customers before they decide to implement them in their operations.<sup>57</sup>

Similarly, German electrical equipment manufacturer Siemens AG has implemented energy management systems in more than 295 locations and maintains compliance with international energy management standards such as ISO 50001 to help the company improve energy efficiency and implement continuous improvement processes.<sup>58</sup>

## **Value Impact**

Management of energy efficiency, energy independence and energy-mix (including

renewable energy) is key to the profitability and risk profile of companies in the Electrical & Electronic Equipment industry.

Cost savings can be achieved through energy efficiency as well as energy source optimization. At the same time, efforts to improve energy efficiency or reduce dependence on specific types of energy can require additional capital expenditures. While the cost of energy consumption is already captured in financial results, overall energy consumption levels provide a sense of firms' exposure to possible future increases in energy prices, resulting from energy providers internalizing the growing environmental and social impacts of energy generation and consumption.

As a portion of operating costs for companies in the industry come from purchased electricity and fuels, the volatility and price of energy can also influence decisions about on-site versus sourced electricity and diversification of energy sources. This can have an impact on companies' long-term profitability and ultimately their risk profile and cost of capital.

The probability and magnitude of financial impacts could increase in the future as emerging governmental regulations on environmental impacts continue to drive energy cost increases and volatility.

The more purchased fuels and electricity a company uses from traditional sources of energy, the more vulnerable it is to rising prices of specific fossil energy sources and the indirect impact of costs from internalization of carbon prices by utilities. The use of independent energy sources (non-grid) can also indicate a degree of control and a company's ability to

provide continuous energy for its facilities, given poor or aging grid infrastructure in both developed and developing countries. The percentage energy from renewables indicates a firm's ability to mitigate its environmental footprint, its exposure to energy cost increases, as well as its energy independence.

## Hazardous Waste Management

Electrical and electronic equipment manufacturing uses a wide variety of hazardous chemicals throughout a company's operations. Toxic compounds used in operations can cause health hazards and environmental damage if not managed or disposed of properly. Examples of hazardous compounds include chromium, nickel, cobalt, trichloroethylene, lead, glycol ethers, and various other chemical compounds.<sup>59; 60</sup> These compounds are classified as hazardous substances under various EPA regulations including CERCLA (Superfund), the Clean Air Act, and the Clean Water Act.<sup>61</sup>

Failure to properly handle and dispose of hazardous materials may lead to significant fines, litigation, and environmental remediation liabilities. In addition to monetary costs, poor disposal of hazardous material can result in significant externalities that can cause irreparable harm to exposed individuals, the environment, and local communities involved. If not properly managed, such externalities can lead to further regulation of the issue, increasing costs for the industry. The industry has faced challenges related to hazardous materials for years, and many companies are still exposed to legacy Superfund sites, paying

millions in ongoing fines and remediation charges.

Effective hazardous waste management and disposal within manufacturing can help a company avoid significant costs and environmental liabilities. Some ways in which companies are reducing hazardous waste is through detailed evaluation of waste streams for hazardous waste reduction and elimination opportunities. Improving employee training can also help prevent mishandling and improper disposal of hazardous waste. Companies can also put in place effective remediation plans to be prepared to address environmental impacts from hazardous waste when they occur.

Company performance in this area can be analyzed in a cost-beneficial way internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Amount of hazardous waste, percentage recycled; and
- Number and aggregate quantity of reportable spills, quantity recovered.

## Evidence

The Electrical & Electronic Equipment industry generates significant quantities of waste and faces relatively high costs related to waste treatment and disposal. In 2011, the EPA ranked the fifty largest quantities of hazardous waste generated by primary NAICS codes in the U.S., and this industry was represented in 12<sup>th</sup> place by the segment for Other Electrical Equipment and Component Manufacturing (NAICS 3359), and in 50<sup>th</sup> place for Electrical Equipment Manufacturing (NAICS 3353). These industry segments respectively generated 117,353 and 9,608 tons of hazardous waste

per year.<sup>62</sup> As a result of the large amounts of hazardous chemicals used and disposed of during production, various electrical equipment companies have recognized the issue in their SEC filings, stating that “potential liabilities and litigation” from environmental regulation and remediation is a risk factor that could adversely impact operations.<sup>63; 64; 65</sup>

ABB notes in its FY2013 Form 20-F filing that substances used in its manufacturing processes are considered hazardous in many jurisdictions where it operates. According to ABB, “Our manufacturing facilities use and produce paint residues, solvents, metals, oils and related residues. We use petroleum-based insulation in transformers, polyvinylchloride (PVC) resin to manufacture PVC cable and chloroparaffin as a flame retardant. We have manufactured and sold, and we are using in some of our factories, certain types of transformers and capacitors containing polychlorinated biphenyls (PCBs).”<sup>66</sup> Improper use or disposal of these hazardous substances could put companies at risk for substantial liabilities due to environmental contamination.

The large number of environmental cleanup sites that electrical equipment manufacturers are or have been involved with is evidence of this risk. For example, Honeywell International was fined \$5 million by the State of New Jersey in 2011 for its role in chromium contamination of the soil at numerous sites.<sup>67</sup> The settlement also makes Honeywell responsible for the monitoring and remediation of more than 126 sites in the state.<sup>68</sup> Highlighting risks from environmental contamination, Honeywell recorded environmental liability payments of \$304 million, \$320 million, and \$270 million for years 2013, 2012, and 2011, respectively.<sup>69</sup> The company estimates in its Form 10-K for

FY2013 that it will have to pay an additional \$643 million in total environmental liability payments over the next four years.<sup>70</sup>

As a result of the poor disposal of hazardous waste in electrical equipment manufacturing, many companies are listed as the sole responsible party or a partially responsible party under the EPA's Superfund law. Rockwell Automation states in its 2013 Form 10-K that it has been listed as a potentially responsible party at 13 Superfund sites. The company estimated its reasonable cost for its exposure to be \$117 million as of September 30, 2013, and expects the discharge and disposal of hazardous materials to continually have an effect on its manufacturing operations.<sup>71</sup> Similarly, Eaton Corporation was involved in remedial response and voluntary remediation at 149 sites worldwide as of the end of 2013.<sup>72</sup> As nearly all major electrical equipment manufacturing companies with large operations in the U.S. have been involved in Superfund sites, resulting in environmental liabilities, hazardous waste management has become a source of ongoing costs and regulatory risks for the industry.

Waste disposal and treatment, especially of hazardous materials, can also represent operating costs and capital expenditures for electrical and electronic equipment manufacturers, although the amounts are likely to be less significant than liabilities from regulatory action or litigation. According to data from the 2005 Pollution Abatement Costs and Expenditures (PACE) survey, the Electrical & Electronic Equipment industry<sup>IV</sup> incurred

operating costs for solid waste pollution abatement of \$61.1 million, accounting for roughly 1.2 percent of the total operating costs for solid waste abatement in all manufacturing industries. Related capital expenditures amounted to \$10.4 million, or 1.5 percent of capital expenditures for solid waste abatement in all manufacturing industries.<sup>73</sup>

Companies have taken steps to mitigate risks associated with hazardous waste by implementing advanced waste management procedures. For example, in 2010 Schneider Electric incorporated its Eco-Production initiative to implement best-practice waste management procedures to mitigate many environmental risks and harness efficiencies. The company voluntarily carries out procedures to prevent discharge into the soil and continually monitors all its emissions to ensure compliance with ISO 14001 certification, an internationally recognized standard that helps companies improve their environmental performance.<sup>74</sup> The company also has preventive and corrective action plans in place in case an environmental emergency does occur. Through these initiatives, the company exceeded its goal of recovering more than 85 percent of hazardous and non-hazardous materials in 2012, and was not subject to any clean-up action or remediation.<sup>75</sup>

General Electric tracks and publishes its key environmental waste data in its corporate sustainability report. For 2012, the company reported 50 spills and releases, 817 U.S. agency inspections, and 36,500 metric tons of hazardous waste.<sup>76</sup> The company also sets key

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<sup>IV</sup> This industry is represented primarily by the following classifications from the 2007 North American Industry Classification System (NAICS), on which PACE data is based: HVAC (NAICS 3334), Electric Lighting (NAICS

3351), Electrical Equipment (NAICS 3353), and other communication, wiring and cable manufacturing (NAICS 33592, 33593, and 33599).

targets for performance on waste issues—for 2012, it set a 30 percent reduction goal for wastewater, spills, and air emissions from 2006 levels.<sup>77</sup>

The importance and likely materiality of this issue is expressed in a recent shareholder resolution asking Emerson Electric to disclose key sustainability data, including waste-reduction targets. The resolution states that if the company does not disclose this information, investors do not have a clear understanding of the risks and opportunities faced by the company. The resolution received a significant 37.6 percent vote by shareholders, up from 35 percent in the previous year.<sup>78</sup>

### Value Impact

The generation of waste impacts operational efficiency and regulatory risks for electrical and electronic equipment companies. Waste treatment or disposal results in ongoing operating expenses related to waste handling. Mishandling of highly-regulated hazardous wastes can lead to fines and contingent liabilities from legal actions, while regulatory agencies may require additional capital expenditures to reach compliance. Frequent fines or unexpected abatement costs can also result in a higher cost of capital.

Conversely, waste management can create operational efficiencies for companies, improving long-term cost structure and profitability.

The quantity of hazardous waste generated and the percent recycled insight into a company's operational efficiency and exposure to legal and regulatory actions, and capital expenditures related to abatement. Past performance on waste management can be a

proxy for future risk, looking at the number and aggregate quantity of releases and spills and percent recovered.

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## SOCIAL CAPITAL

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Social capital relates to the perceived role of business in society, or the expectation of business contribution to society in return for its license to operate. It addresses the management of relationships with key outside stakeholders, such as customers, local communities, the public, and the government.

As electrical and electronic equipment companies play a vital, typically behind-the-scenes role in the daily lives of millions, their products can have a significant impact on the health and safety of their customers. Specifically, the ability of companies to manage product quality and safety will be critical to managing their reputation and brand value.

## Product Safety

Electricity is an essential part of everyday life. Proper safety procedures and protocols around electrical equipment can help prevent property damage, injuries, and even accidental death for users of electronic equipment. Incidents such as these can result from electrical fires caused by faulty equipment and components or exposure to hazardous materials contained in products. While the reliability of electronic and electrical equipment is crucial to a user's safety, there are also hazardous chemicals used in products that have been found to affect the health and safety of end users, resulting in multiple product liability claims.

Electrical equipment manufacturers can test the quality and safety of their products to ensure the products meet or exceed industry standards and do not cause unnecessary harm or damage to end users. If current and future product safety is not managed effectively, it can result in large product liability claims and potential regulation, costing companies millions. When accidents occur, products are typically recalled or “safety notices” are released to customers. This may cause significant damage to the company’s reputation and future sales of similar products, and can result in immediate costs to correct the problem.

High standards for product quality and safety testing help companies reduce reputational risks associated with recalls or safety notices, protect sales and warranty costs, and reduce remediation costs.

Company performance in this area can be analyzed in a cost-beneficial way internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Number of recalls and total units recalled; and
- Amount of legal and regulatory fines and settlements associated with product safety.

## Evidence

According to data collected by the U.S. Fire Administration’s Incident Reporting System, electrical fires in residential buildings cause more than 360 deaths, 1,000 injuries, and \$995 million in damages each year.<sup>79</sup> Eighty-nine percent of electrical fires in residential buildings were caused by electrical failures,

including malfunctioning equipment, short-circuited arcs, and defective wire insulation.<sup>80</sup>

Company sales could be affected if products do not meet regulatory requirements related to safety. For example, in the U.S., certain products used in the workplace must gain approval from a Nationally Recognized Testing Laboratory to ensure they can be used safely, according to OSHA Safety Standards. Electric equipment accounts for the largest product category subject to such requirements.<sup>81</sup>

There are numerous examples of product recalls due to faulty products by nearly every major company in the Electrical & Electronic Equipment industry. For example, in 2010, Siemens AG recalled 2.2 million circuit breakers after it was determined that the product had a faulty spring, which could result in the circuit breaker starting a fire, causing property damage and personal injury.<sup>82</sup> Similarly, in 2014, Schneider Electric recalled about 28,400 units of a circuit breaker after it was found that the product failed to trip when an overload occurred, which could cause serious risk of fire, burn, and electric shock. The recall involved replacement of the unit at no charge to customers, including an allowance of up to \$300 per site for labor costs. The product had been originally sold to customers for between \$200 and \$9,260.<sup>83</sup> Free replacement of the product indicates lost revenues for Schneider in the range of \$5.7 million to about \$263 million, excluding the labor cost allowance.<sup>84</sup> In 2013, Schneider Electric was forced to recall more than 15 million surge protectors after they were reported in 55 claims of property damage due to fires and caused more than 13 personal injuries.<sup>85</sup>

As a result of poor product safety and the presence of hazardous materials in products, companies can receive product liability claims resulting in large monetary outflows, including warranties and litigation expenses to compensate for personal harm or damages. For example, Rockwell Automation maintained product liability claims of \$21 million in 2013,<sup>86</sup> while Honeywell International had product warranty and claims costs of more than \$212 million in 2013.<sup>87</sup>

Companies in the industry recognize the risk of failing to make products with the highest quality and safety standards. Acuity Brands, a U.S. maker of lighting equipment and systems used in commercial buildings, has recognized the risk of product recalls, product liability claims, and damages associated with poor product quality in recent SEC filings.<sup>88</sup> Similarly, Emerson Electric notes, in its Form 10-K for FY2013, the risk of “product liability and environmental matters” and states that these can result in significant damages to operations.<sup>89</sup> Tyco International discusses its exposure to product liability claims, mentioning that recalls or redesigns could result in significant unexpected costs, affect insurance coverage, or result in adverse publicity, which could adversely affect its financial condition, results of operations, or cash flows.<sup>90</sup>

### **Value Impact**

Companies that fail to manage product quality and safety risks proactively can face significant reputational impacts, and face declining long-term demand for their products, resulting in loss of market share. Poor design, manufacturing, or installation of a company’s products can result in recalls or product liability and warranty claims that can have a significant

impact on sales, warranty costs, and profitability. Similarly, litigation or settlement costs and contingent liabilities can also result from product liability claims for personal injury or property damage. Chronic mismanagement of the issue may result in higher-than-industry-average warranty claims and cost structure and can raise a company’s cost of capital.

Past performance on product safety can be indicative of future performance, looking at the number of recalls and quantity products recalled. Similarly, the amount of legal and regulatory fines and settlements associated with product safety is a lagging indicator of how companies manage the safety of their products. These metrics also indicate the probability and magnitude of the financial impact of safety incidents.

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## **BUSINESS MODEL AND INNOVATION**

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This dimension of sustainability is concerned with the impact of environmental and social factors on innovation and business models. It addresses the integration of environmental and social factors in the value-creation process of companies, including resource efficiency and other innovation in the production process. It also includes product innovation and efficiency and responsibility in the design, use-phase, and disposal of products. It includes management of environmental and social impacts on tangible and financial assets—either a company’s own or those it manages as the fiduciary for others.

The Electrical & Electronic Equipment industry plays a critical role in connecting individuals and businesses to the electric grid and

automating key industrial processes. The ability to improve existing products and services and develop new ones to meet consumer demand, while also addressing negative environmental externalities, will increasingly impact shareholder value, particularly as legislation and consumer demand grows for energy-efficient products that incorporate non-hazardous materials.

## Product Lifecycle Management & Innovation for Environmental Efficiency

In addition to operational energy management (see above), electrical and electronic equipment companies face increasing challenges associated with environmental externalities attributed to product design, use, and disposal. Specifically, companies must address how their products are designed for use-phase energy efficiency and end-of-life reuse or remanufacturing. The use of toxic materials in products can affect their end-of-life disposal and recyclability or reusability. Companies can address externalities associated with energy use and hazardous materials by improving the energy efficiency of their products and by replacing harmful materials used in products. In addition, companies can innovate to develop products and services that enable their customers and the wider economy to reduce their environmental footprint in other ways. With different sectors facing increasing regulatory and cost incentives to reduce energy consumption or lower emissions, such innovative products and services could represent a large market opportunity for early developers.

It is estimated that the residential, industrial, and commercial sectors consumed roughly 80 percent of the world's total energy generated in 2011. Electrical and electronic equipment plays an integral role—and is a significant source of energy consumption—in all of these sectors.<sup>91</sup> New regulations and increased demand for energy conservation will make the development of more energy-efficient products a key strategic initiative for electrical and electronic equipment manufacturers. More energy-efficient products will be paramount to achieving the energy and emission-reduction targets of a company's customers, contributing to higher demand for such products.

Furthermore, electrical and electronic equipment companies face growing concerns and emerging regulations around the use of specific chemicals in their products. The use of such chemicals can result in environmental damage and human health impacts at products' end-of-life stage.

At the end-of-life stage, heavy metals, flame retardants, and other potentially harmful compounds found in electronic and electrical waste can have negative effects on the health of humans who are exposed to these toxic chemicals. The degree of impact depends largely on the method used to recycle or dispose of electronic and electrical products. For example, manual disassembly (as opposed to automated disassembly) can lead to varying levels of impact due to exposure. Similarly, landfilling electronic waste (e-waste) comes with its own level of risk, including leaching of hazardous chemicals, such as lead and flame retardants, into the soil.<sup>92</sup> Developing countries are a destination for much of the world's e-waste, as these countries typically have lax regulation and cheap labor. This makes it less

expensive in the short term for companies (or their recycling and waste-handling partners) to ship e-waste to such countries than to pay higher costs for local disposal in developed countries with higher environmental standards.<sup>93</sup>

However, regulations could increase the long-term costs of using harmful materials in products and enforce extended producer responsibility related to products' end-of-life. Laws such as the E.U. RoHS and WEEE directives that set limits on the use of hazardous materials and require manufacturers to be financially responsible for product end-of-life management could be implemented in more jurisdictions, including developing countries, and cover more electrical or electronic equipment. In order to ensure compliance with existing regulations and prepare for evolving regulations and customer demand, companies in the industry could invest in R&D to design products that use safer alternative materials and are easy to reuse or recycle. In addition, companies can implement take-back programs that allow for the safe disposal of products. This has the added benefit of allowing companies to refurbish and sell products or recover valuable materials used in the production process.

Another area of concern is the use of critical and conflict minerals and metals facing supply constraints and price volatility, along with reputational risks. (Primarily discussed under the topic of Materials Sourcing below). This increases the importance of design strategies to reduce materials use, and improving recycling at the end-of-life to recover valuable materials.

Apart from designing products that are more energy-efficient and use safer materials,

companies in the industry have the opportunity to design products and services to address specific environmental concerns in the broader economy, particularly the energy sector. The impacts of climate change and severe weather on the electric grid has led to concerns over its resiliency in both developed and developing countries. Smart grid technology has the potential to upgrade and improve the overall integrity and resiliency of the electric grid. In addition, the trend toward smart grid technology offers electrical and electronic equipment manufacturers multiple opportunities to shape and improve the way that consumers access and use electricity, with a potential to improve energy efficiency in the economy.

Furthermore, in order to modernize the electric grid and lower GHG emissions, governments and industries are looking at ways to integrate intermittent renewables into the grid. Innovative new products that allow renewable energy to be connected seamlessly to the grid can solve key dilemmas in the global energy economy, strengthening a company's social license to operate and opening up new opportunities for growth.

Company performance in this area can be analyzed in a cost-beneficial way internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Percentage of products by revenue that contain IEC 62474 declarable substances;
- Percentage of eligible products by revenue meeting ENERGY STAR® criteria;

- Revenue from renewable energy-related and energy-efficiency-related products; and
- Total energy cost savings achieved through energy performance contracts.

## Evidence

Electrical and electronic equipment companies are facing increasingly stringent regulations regarding potentially hazardous substances used in their products, which could affect their profitability. Companies designing products to reduce or eliminate the use of toxic or supply-constrained materials in their products are likely to benefit from expanded market share relative to peers, lower regulatory compliance costs, and lower input price or supply volatility.

Existing and planned legislation on hazardous substances in the U.S. at the state level and in the E.U., China and other regions create compliance risks, potentially increasing costs and limiting the global market for electrical and electronic equipment that incorporate harmful chemicals (see Legislative and Regulatory Trends section). TE Connectivity discusses these laws and associated costs in its Form 10-K for FY2014, “We have a program for compliance with the European Union (“EU”) Restriction of Hazardous Substances and Waste Electrical and Electronics Equipment Directives, the China Restriction of Hazardous Substances law, the EU REACH (chemical registration and evaluation) Regulation, and similar laws. Compliance with these laws has increased our costs of doing business in a variety of ways and may continue to do so in the future. For example, laws regarding product content and chemical registration require extensive and costly data collection, management, and reporting.”<sup>94</sup>

The E.U.’s RoHS directive of 2006 was geared mainly toward household and consumer electronics, and some products of electrical and electronics equipment companies were subject to similar regulations. As of January 2013, however, a new E.U. directive, RoHS2, has extended the reporting category requirements to set limits on the use of hazardous substances including lead, hexavalent chromium, mercury, cadmium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDEs) in additional electronic and electrical equipment segments.<sup>95; 96</sup> Some of these substances, like cadmium, which is known for its superior conductivity and low erosion characteristics, are used widely in electronic and electrical equipment.<sup>97</sup> Along these lines, the National Electrical Manufacturers Association (NEMA) in the U.S. initiated a “Call to Action” regarding hazardous substances and adopted the E.U. RoHS directive to drive change in the Electrical & Electronic Equipment industry.<sup>98</sup>

Some companies aim to manage hazardous substances proactively beyond the legal reach of the European directives. For example, Schneider Electric decided to eliminate RoHS substances from all its products including those not affected by the directive and those sold outside the E.U. According to the company, this helped anticipate regulations in other jurisdictions, enabling it to sell its RoHS-compliant products worldwide. The company’s information management systems integrate substance management, automating REACH and RoHS reports. This not only improves communication to customers regarding hazardous substances, but also enables the company to identify possible obsolescence in its offerings.<sup>99</sup>

Additionally, companies are starting to recognize the value of “closing the loop” between product creation and disposal. Due to concerns about growing amounts of e-waste and its environmental impacts, state and national governments globally have been introducing laws related to managing such waste (see Legislative and Regulatory Trends section). E.U. WEEE applies the producer responsibility principle, requiring manufacturers or importers of electronic equipment to bear the cost of recycling at the end-of-life.<sup>100</sup> Penalties, costs, or lost revenues due to such laws, together with potential revenues from refurbishing and re-selling products, and cost savings and risk mitigation from critical materials recovery, are increasingly providing incentives for companies in the industry to manage end-of-life impacts.

For example, Siemens’ healthcare segment has a four-part product take-back concept, including system refurbishing, component reuse, parts extraction, and further use or recycling. Siemens has developed a network of disassembly and recycling facilities for customers’ used equipment. This program frees customers from the hassle of disposing of their equipment and allows Siemens an opportunity to extract valuable material or refurbish products for resale. Siemens’ refurbishment process enables the reuse of an average of 90 percent of materials, while the refurbished systems are of the same quality as new systems, yet purchase costs for customers are an average of up to 20 percent lower.<sup>101</sup>

Energy efficiency in the use phase of electrical and electronic equipment is becoming a top priority for customers. This is driven by potential cost savings as well as legislative action, and could affect the procurement of,

and demand for, products from the industry. The proposed Energy Savings and Industrial Competitiveness Act in the U.S. aims to spur an increase in new energy-efficient technology to be used in residential, commercial, and industrial applications, which has implications for products sold by companies in this industry.<sup>102</sup> The bill aims to save the U.S. economy an estimated \$99 billion in energy costs and reduce CO<sub>2</sub> emissions by 650 million metric tons.<sup>103</sup> Other countries, such as Germany, have also implemented new energy and climate-related goals throughout their economies. For example, Germany has set targets to reduce energy consumption by 20 percent by 2020 and 80 percent by 2050, which will require adoption of energy-efficient technologies, including electrical equipment in buildings.<sup>104</sup>

These new legislative initiatives and increasing customer interest in energy-efficient products are driving much of the demand for electrical and electronic equipment and will greatly impact the entire industry in the short and long term. Energy-efficient products were highlighted as a key driver in a recent analyst report on Emerson Electric, which states that “the strong secular growth driver of energy efficiency is central to over 50 percent of Emerson’s (product) portfolio.”<sup>105</sup> Other companies have highlighted this opportunity as well, including Schneider Electric, which stated, “energy efficiency is a growing need of our customers,” and added that the opportunity expands addressable markets for their products.<sup>106</sup>

Electrical equipment manufacturers are making large commitments to R&D for products that improve energy efficiency and reduce carbon emissions. Ingersoll Rand noted the following

product objectives in its FY2014 Form 10-K: “(i) 50 percent reduction in the greenhouse gas refrigerant footprint of our products for customers by 2020 and lower global warming potential alternatives across our portfolio by 2030; (ii) \$500 million investment in product-related research and development over the next five years to fund the long-term reduction of greenhouse gas emissions.”<sup>107</sup>

In 2014, GE renewed its commitment to its Ecomagination initiative by committing another \$10 billion in R&D for cleaner technology by 2020, on top of \$12 billion already spent.<sup>108</sup> In 2012, Eaton Corp spent \$439 million, its total R&D spend, on innovative products and solutions aimed at addressing the energy- and emission-reduction requirements of its customers.<sup>109</sup>

This research may prove to be prolific for companies as they develop products that save customers money and reduce their energy consumption and emissions. In 2008, Siemens launched its Environmental Portfolio (EP) segment to address its customers’ concerns about energy efficiency and CO<sub>2</sub> emissions. In 2013, the Siemens EP segment generated more than €32.3 billion and accounted for 43 percent of the company’s total revenue, while helping customers avoid 377 million tons of CO<sub>2</sub> emissions.<sup>110</sup> The elements included in the EP portfolio can be products, services, or solutions that cover energy efficiency, renewable energy, smart grid, and environmental technologies. To meet the criteria for energy efficiency, a product must improve energy efficiency by 20 percent or reduce 100,000 metric tons of CO<sub>2</sub> during the customer’s use phase, compared to baseline levels.<sup>111</sup> Similarly, Schneider Electric reports that its Green Premium products, which

demonstrate carbon savings in the product lifecycle and are in compliance with REACH and RoHS requirements for substances of concern, accounted for just over 65 percent of revenues in 2012, against a target of 75 percent by 2014.<sup>112</sup>

In 2014, Emerson Electric launched a new generation of variable speed compressors and motors used in HVAC systems that provide annual energy savings of up to 40 percent.<sup>113</sup> This can result in significant savings for Emerson’s customers, as HVAC systems are responsible for nearly 30 percent of all electricity consumed in the industrial and commercial sectors.<sup>114</sup> ABB noted in its FY2013 Form 20-F that it launched an Emax 2 breaker in 2013, the first low-voltage circuit breaker with integrated energy management functions. When compared to traditional breakers, the Emax 2 was estimated to have the potential to achieve a four million-ton reduction in CO<sub>2</sub> emissions and annual electricity savings equivalent to the annual consumption of 1.4 million E.U. households.<sup>115</sup>

In addition to developing products that enable energy efficiency and lower GHG emissions for customers, companies are utilizing innovative practices to create new market demand for services that improve energy efficiency, by lowering up-front costs for energy-efficiency improvements. For example, Eaton Corp is a Department of Energy-qualified energy services company (ESCO) that funds energy-efficiency projects by allowing customers to use energy savings to pay for projects over time, without having to pay large up-front capital costs.<sup>116</sup>

Innovative and disruptive technologies have the opportunity to open up new markets by helping address key societal issues. For

example, new products aimed at improving access to renewable energy sources and integration of these sources into the grid can help lower the levelized cost of energy for these new energy sources, while also helping countries meet their emissions targets and reduce their dependence on fossil fuels.<sup>117</sup>

In collaboration with General Motors, Switzerland-based electrical company ABB found a use for Chevrolet Volt batteries after their automotive life-phase is over. This solution would allow the batteries to be linked to the electric grid and provide a backup source of energy when demands peak or outages occur. The system of batteries and inverters could store energy from renewable energy sources and provide enough energy to power 50 homes for around four hours during outages.<sup>118</sup> ABB also won a \$35 million order in February 2015 for innovative switchgear and reactors that would help stabilize and expand Belgium's power grid to integrate more wind energy.<sup>119</sup>

Severe weather is the leading cause of power outages, and it is estimated to have caused 679 widespread power outages in the U.S. between 2003 and 2012, each affecting more than 50,000 customers. When power outages occur, it disrupts millions of lives and impedes the economy. It is believed that power outages cost the U.S. economy between \$18 billion and \$33 billion annually. This cost can be significantly more in years with major storms, such as Hurricane Sandy in 2012, which alone was estimated to have caused \$65 billion in damages.<sup>120</sup> Climate change is expected to increase extreme-weather events, with potentially higher costs in the future. Grid resiliency has therefore been a priority for the White House, which released "A Policy Framework for the 21<sup>st</sup> Century Grid" in 2011,

directing billions of U.S. dollars to improve and upgrade smart grid technologies and make the electric grid more efficient, reliable, and resilient and less vulnerable to weather-related outages.<sup>121</sup>

Innovations such as smart grid technology can help improve the resiliency of the electrical infrastructure, benefiting end users. During Hurricane Sandy, communities that had smart grid meters experienced less downtime; use of such meters also allowed power companies to identify outage locations much more quickly than in communities without smart grid technology.<sup>122</sup> McKinsey estimates that the potential near-term global market for smart grid equipment could range anywhere from \$15 billion to \$31 billion annually. Growth is likely to be faster in emerging markets such as China, where the transmission and distribution infrastructure is still developing and could leapfrog traditional technologies.<sup>123</sup>

With innovative new products like the aforementioned examples, electrical and electronic equipment manufacturers have a unique opportunity to provide value not only to the environment and their customers, but shareholders as well. Ninety-two percent of experts in SASB's industry working group agreed that the topic is likely to constitute material information for companies in the industry, and SASB's heat map analysis identified the topic as a top quartile one for the industry, with the highest heat map score among the topics discussed in this brief.

### **Value Impact**

Regulations, industry standards, and customers are driving the demand for products with limited lifecycle environmental impacts and innovative solutions for environmental

concerns. Product lifecycle management and innovation for environmental efficiency has a direct impact on growth opportunities and competitiveness of companies in the Electrical and Electronic Equipment industry, potentially impacting existing and new markets and pricing power.

Companies in this industry can also face significant costs to comply with regulation or standards around the use of chemicals of concern in their products; companies unable to address evolving regulations around use of safer chemicals may face higher costs of capital and an increased risk profile. Removing a product from the market can lead to short-term and long-term revenue and market share loss while compliant products are being developed. In addition, companies may incur fines and fees for non-compliance.

Proactive management of the lifecycle characteristics of products – from energy efficiency and emissions to harmful chemicals in products – can lead to significant R&D and capital expenditures. At the same time it can position companies to leverage long-term growth opportunities, increase brand value, and avoid costly regulation.

The probability and magnitude of impacts from product lifecycle management are likely to increase in the medium term as environmental legislation becomes more stringent and customers demand innovative solutions to reduce their energy use and emissions.

Companies' positioning in the growing market for environmental efficiency can be assessed by looking at the proportion of energy-efficiency and renewable energy-related products in their overall product portfolio, as well as customer

cost savings from energy performance contracts. Companies' exposure to costs and liability associated with chemicals of concern can be estimated using the percentage of products that contain (IEC 62474) declarable substances;

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## LEADERSHIP AND GOVERNANCE

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As applied to sustainability, governance involves the management of issues that are inherent to the business model or common practice in the industry and are in potential conflict with the interest of broader stakeholder groups (government, community, customers, and employees). They therefore create a potential liability, or worse, a limitation or removal of license to operate. This includes regulatory compliance, lobbying, and political contributions. It also includes risk management, safety management, supply chain and resource management, conflict of interest, anti-competitive behavior, and corruption and bribery.

Electrical and electronic equipment companies rely on increasingly complex and geographically diverse supply chains for critical raw material inputs, magnifying some of these risks. There is potential for anti-competitive behavior due to the relatively large market share of major companies. There is a high potential for violations of bribery laws around the world as equipment companies seek new growth opportunities. These factors will play an increasingly important role in shareholder value, as the supply chain and regulatory environment are constantly shifting.

## Business Ethics & Competitive Behavior

Electrical and electronic equipment manufacturers have been under increasing scrutiny by authorities due to the use of anti-competitive business practices, which have resulted in significant fines and litigation expenses. As discussed earlier, the industry is becoming increasingly concentrated, with larger players acquiring greater market power, particularly in global operations. Companies may willingly or unknowingly act like a cartel, colluding to fix prices or engaging in other anti-competitive behavior, violating antitrust laws. The Sherman Antitrust Act, Clayton Act, and Federal Trade Commission Act are the three major federal antitrust laws governing this and other industries within the U.S.; similar laws exist in other countries.

Furthermore, the global operations of the large players in the industry, as well as the nature of the business, which often requires securing contracts with private and public players, can expose companies to the risk of regulatory scrutiny of possible bribery and corruption. Companies in the industry have been found to violate the Foreign Corrupt Practices Act in the U.S. and have faced investigations by authorities in other countries.

These anti-competitive and unethical practices can result in significant fines and costs that may be considered material to investors. Effective governance structures and processes can address corruption and willful or unintentional participation in bribery or anti-competitive business practices. Company performance in this area can be analyzed in a cost-beneficial way internally and externally

through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Description of the management system for prevention of corruption and bribery throughout the value chain;
- Amount of legal and regulatory fines and settlements associated with charges of bribery or corruption; and
- Amount of legal and regulatory fines and settlements associated with anti-competitive practices.

### Evidence

Large antitrust cases have been filed by regulators against many of the large electrical and electronic equipment companies in the industry. In 2007, European regulators fined a group of ten large electrical companies a combined \$977 million for the price-fixing of electrical transmission equipment. Siemens paid the largest portion, worth more than \$516 million.<sup>124</sup> Two months later, Siemens was under investigation again for suspected price fixing of transformers,<sup>125</sup> and Schneider Electric paid fines for similar practices.<sup>126</sup>

In 2013, Siemens faced further scrutiny from authorities in Brazil after it was alleged that companies colluded to fix prices for construction, equipment, and upkeep of a public transit system in São Paulo; the company is also alleged to have engaged in bribery during tender proceedings. In relation to the São Paulo transit system case, in December 2014, police froze more \$223 million in assets of six companies, including five foreign entities such as Siemens and France's Alstom. According to Siemens, the case was brought against it after it voluntarily furnished information to authorities following an internal

audit.<sup>127</sup> In relation to the bribery charges, a federal court banned the company from making any future bids on federal contracts for the next five years.<sup>128; 129</sup>

Similarly, ABB reported in its FY2013 Form 20-F filing that its cables business is under investigation for alleged anti-competitive practices in a number of jurisdictions, including Brazil and the European Union, and has agreed to pay fines of approximately \$1 million and \$11 million, respectively.<sup>130</sup>

As discussed earlier, companies in the industry have global operations, exposing them to the risk of corrupt practices by employees or affiliates in certain countries. Companies have been subject to substantial fines related to the FCPA in the U.S. Siemens AG paid a record \$1.6 billion in fines to American and European authorities for using bribing tactics to secure large contracts around the world.<sup>131</sup> In 2011, Rockwell Automation paid more than \$2.76 million to settle charges with the SEC for violating the FCPA.<sup>132</sup> ABB reported in its Form 20-F filing that it had reached a settlement between the Department of Justice (DoJ) and SEC totaling \$58 million for suspected payments involving some of its subsidiaries in the United Nations Oil-for-Food Program.<sup>133</sup> ABB, together with Siemens and others, was also being investigated by Swiss authorities in 2014 for allegedly bribing Gazprom in order to receive contracts related to the Yamal Pipeline.<sup>134</sup>

According to Tyco International's FY2014 10-K filing, "Recent years have seen a substantial increase in anti-bribery law enforcement activity, with more frequent and aggressive investigations and enforcement proceedings by both the Department of Justice ("DOJ") and

the U.S. Securities and Exchange Commission ("SEC"), increased enforcement activity by non-U.S. regulators, and increases in criminal and civil proceedings brought against companies and individuals."<sup>135</sup>

The company further notes that it operates "in many parts of the world that are recognized as having governmental and commercial corruption and in certain circumstances, strict compliance with anti-bribery laws may conflict with local customs and practices."<sup>136</sup> Operating in high-risk areas could put companies at risk for expensive and time-consuming investigations and litigation processes, requiring strong governance and management structures to deal with such issues. Tyco further states, "Violations of these laws may result in criminal or civil sanctions, which could disrupt our business and result in a material adverse effect on our reputation, business, results of operations or financial condition."<sup>137</sup>

## Value Impact

Violations of anti-corruption laws and anti-competitive behavior can result in substantial fines, sanctions, and civil and criminal penalties, creating extraordinary expenses and contingent liabilities. Regulatory actions could also curtail operations in certain jurisdictions, and actual or alleged violations could damage a company's reputation and ability to do business, with impact on revenue and long-term growth prospects. Companies with a record of non-compliance with regulations could also face higher costs of capital due to a higher risk premium.

Legal and regulatory fines associated with bribery or corruption characterize past performance as a proxy for how well companies manage regulatory compliance and

provide an understanding of the probability and magnitude of corruption or anti-competitive incidents.

## Materials Sourcing

Electrical and electronic equipment companies are exposed to the risk of supply chain disruptions, input price increases or volatility, and damage to brand reputation when rare earth or “conflict” minerals and metals are used in their products. The use of minerals that originate from certain zones of conflict also exposes companies to regulatory risks associated with the Dodd-Frank Act in the U.S. as well as other global legislation.

All conflict minerals—tin, tantalum, tungsten, and gold—are used in electronic equipment manufacturing, which could represent a significant cost for companies in order to comply with these new regulations.<sup>138</sup> The extraction of these minerals has the potential to fuel conflict, human rights violations, and illicit activities in regions where they are mined, in addition to their environmental impacts. Companies face pressure from legislation, actions by non-governmental organizations (NGOs), input price risks, and leadership from peers to track and eliminate the use of conflict minerals.

At the same time, there are materials sourcing risks related to rare earth minerals and metals due to a low substitution ratio, concentration of deposits in only a few countries, and geopolitical considerations. Electrical and electronic equipment companies also face competition due to increasing global demand for these critical minerals from other sectors, including Transportation, Renewable Energy, and Technology, which, along with supply

constraints, can result in significant price increases and supply-chain risks.

Benefits could be gained by a company’s ability to quickly reduce dependency on conflict and critical minerals and comply with all current and future forms of regulation. Company performance in this area can be analyzed in a cost-beneficial way internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Percentage of materials costs for products containing critical materials;
- Percentage of tungsten, tin, tantalum, and gold smelters within the supply chain that are verified conflict-free; and
- Discussion of the management of risks associated with the use of critical materials and conflict minerals.

### Evidence

Artisanal and small-scale mining in the DRC is responsible for much of the current global output of 3TG. While such mining is an important source of livelihood to the local population, it also is helping to finance armed conflict in the region and has significant ecological impacts. Several legislative and project-based efforts are underway globally to improve traceability and due diligence with respect to the supply of minerals from the DRC. These efforts have the potential to affect electrical and electronic equipment companies and their suppliers, as they include the provision of incentives and resources for leadership in supply chain management. For example, USAID’s Responsible Minerals Trade Program includes the creation of a pilot conflict-free supply chain.<sup>139</sup>

A recent SEC mandate, directed by Dodd-Frank Section 1502, requires all SEC issuers to disclose the source and use of conflict minerals throughout a company's supply chain. The SEC estimates the cost of compliance for more than 6,000 companies to be \$3 billion to \$4 billion in the first year and \$207 million to \$609 million for every year after.<sup>140</sup> If a company does not comply in good faith, it can be exposed to legal liability; furthermore, it may face pressure from activists, NGOs and market forces to prove the supply chain is "conflict-free."<sup>141</sup> According to Ernst & Young, the "electronics and communications" industry is among the industries that are most likely to be affected by the rule.<sup>142</sup>

Apart from regulatory costs, global input prices for 3TG have shown high volatility, sometimes related to the conflict in the DRC. A 31 percent increase in tin prices in 2008 coincided with a rebel offensive against the DRC's primary tin trading center. The DRC also leads global production of tantalum, with various estimates suggesting it is responsible for eight to 20 percent of global production.<sup>143</sup> Due to supply constraints and rising demand, the price of tantalum increased from \$110 per kilogram (kg) in 2011 to nearly \$300 per kg in 2012.<sup>144</sup>

As companies were expected to disclose conflict minerals information by June 2, 2014, some companies started implementing procedures a couple of years in advance to alleviate the burden of new disclosure. For example, General Electric built supplier programs to engage in communication between suppliers, the company, and outside organizations to eliminate the use of conflict minerals in its supply chain. The company has sponsored programs like the Conflict-Free Smelter Program and the Public-Private Alliance

to ensure minerals are not sourced from the DRC region.<sup>145</sup>

Siemens and many other companies in the industry have identified compliance as a material risk if they cannot comply fully with disclosure requirements or source materials from conflict-free regions.<sup>146</sup> For example, TE Connectivity discusses in its Form 10-K for FY2014 that the Dodd-Frank conflict minerals requirements "could affect the sourcing, pricing, and availability of 3TG used in the manufacture of certain of [the company's] products. As a result, there may only be a limited pool of suppliers who can demonstrate that they do not source any 3TG from the Covered Countries, and [the company] cannot assure [...] that [it] will be able to obtain non-conflict 3TG in sufficient quantities or at competitive prices." The company goes on to say, "since our supply chain is complex, we may face reputational challenges with our customers and other stakeholders if we are unable to sufficiently verify the origins for all conflict minerals used in our products through the due diligence procedures that we are implementing."<sup>147</sup>

Companies in the industry also recognize the risk of sourcing rare earth and other critical minerals, which are used in a broad range of industry products. Concentration of rare earth minerals in particular geographies could pose problems for companies due to political or social unrest, climate change impacts, or other environmental and social factors.<sup>148</sup> For example, the British Geological Survey estimates that China is the top producer of 27 out of 52 critical minerals and metals.<sup>149</sup> Furthermore, recent Yale University research shows that out of 62 metals or metalloids commonly used in electronic hardware, none

had alternatives that performed equally well, and 12 had no alternatives at all.<sup>150</sup>

Materials like tungsten (both a critical and conflict mineral), of which China maintains more than 86 percent market share, are used in a wide variety of industry products such as lighting filaments, electrodes, electrical contacts, and wiring.<sup>151; 152</sup> Highlighting the supply chain risk of rare earth minerals, China restricted the export of rare earth elements in 2010, attributing the decision to environmental concerns. This led to a fivefold increase in the price of such materials for international markets, while Chinese companies were able to obtain the same materials at lower costs. At the end of December 2014, China revoked its export restrictions after losing an appeal to the World Trade Organization (WTO), which ruled that the Chinese government did not have reasonable grounds for a trade quota.<sup>153</sup> However, the concentration of rare earth minerals' production in China continues to pose supply risks for electrical and electronic equipment companies, particularly those with operations outside of China.

During a quarterly conference call in 2011, an analyst asked Acuity Brands, a producer of large commercial lighting equipment, how rare earth minerals were affecting its business. Management stated that they were facing cost pressure from components containing rare earth minerals, as the minerals were becoming "very expensive," and would have to respond by increasing prices.<sup>154</sup> Philips, a larger global producer of lighting components, highlighted the risk of rare earth mineral scarcity in a 2014 management call, stating that the company was in the process of "de-risking" in the event of future shortages and surges in price.<sup>155</sup>

In its FY2014 Form 10-K, Emerson Electric discusses risks related to raw materials sourcing, including rare earths: "Emerson seeks multiple sources of supply for each of its major requirements in order to avoid significant dependence on any one or a few suppliers. However, the supply of materials or other items could be disrupted by natural disasters or other events. Significant shortages or price increases could impact the prices our affected businesses charge, their operating costs and the competitive position of their products and services, which could adversely affect our results of operations."<sup>156</sup>

## Value Impact

The sourcing of critical materials has the potential to result in increasing costs of key inputs and lost revenue due to disruptions in production. Companies may face regulatory compliance costs and reputational risk associated with the sourcing of conflict minerals if they fail to verify or avoid these materials, resulting in further lost revenue and lower profitability over the medium to long term.

Reliance on critical or conflict minerals leaves companies open to potential supply chain disruptions and increased costs when shortages or price spikes occur. The increasing scarcity or unavailability of certain key materials used by electrical and electronic equipment companies, as well as the price volatility of such materials, can increase companies' risk profile and cost of capital if these companies rely heavily on such materials and are unable to source them effectively. Increasing scarcity also suggests that the probability and magnitude of these impacts are likely to increase in the future. Companies that invest in R&D for alternative

materials or equipment that avoids the use of rare earth or conflict minerals may be better positioned to manage price increases and supply constraints.

The percentage of a company's products that contain critical materials indicates a company's exposure to the risk of supply disruption and price volatility. The percentage of tungsten, tin, tantalum, and gold smelters within the supply chain that are verified conflict-free indicates the extent of a company's exposure to conflict minerals, in terms of both supply and regulatory risk.

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## SASB INDUSTRY WATCH LIST

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The following section provides a brief description of sustainability issues that did not meet SASB's materiality threshold at present, but could present material issues in the future.

**Data Privacy & Security:** Many consumers worry about data privacy and security in smart grid and smart meter technology, which could lead to slower adoption of the technology. Consumers fear that the ability of smart grid technology to track their personal data and behavioral patterns may expose them to outside risk, i.e., home invasions, privacy invasion, and identity theft.<sup>157</sup>

Addressing these concerns may lead to faster acceptance of smart grid technology. In 2009, the U.S. Department of Energy (DOE) launched smart grid grants totaling \$3.4 billion to roll out smart grid technology to more than 18 million homes within three years.<sup>158</sup> The DOE recognizes the benefits of grid resiliency and reducing energy consumption but also warns of the privacy concerns and sensitivity of information collected with smart grid technology.<sup>159</sup> Concerns over data privacy and security may develop into a material issue for the industry as electrical and electronic equipment manufacturers continue to roll out smart grid technology.

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## APPENDIX I:

### Five Representative Electrical & Electronic Equipment Companies<sup>v</sup>

COMPANY NAME (TICKER SYMBOL)
Honeywell International (HON)
ABB LTD (ABB)
General Electric (GE)
Rockwell Automation, Inc. (ROK)
Emerson Electric (EMR)

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<sup>v</sup> This list includes five companies representative of the Electrical & Electronic Equipment industry and its activities. This includes only companies for which the Electrical & Electronic Equipment industry is the primary industry, companies that are U.S.-listed but are not primarily traded over the counter, and for which at least 20 percent of revenue is generated by activities in this industry, according to the latest information available on Bloomberg Professional Services. Retrieved on January 30, 2015.

## APPENDIX IIA: Evidence for Sustainability Disclosure Topics

Sustainability Disclosure Topics	EVIDENCE OF INTEREST				EVIDENCE OF FINANCIAL IMPACT				FORWARD-LOOKING IMPACT		
	HM (1-100)	IWGs		EI	Revenues & Cost	Asset & Liabilities	Cost of Capital	EFI	Probability & Magnitude	Externalities	FLI
		%	Priority								
Energy Management	85*	85	3	High	•		•	Medium	•		Yes
Hazardous Waste Management	95*	77 <sup>/1</sup>	2t	High	•	•	•	Medium			No
Product Safety	60*	92	2t	High	•	•	•	High			No
Product Lifecycle Management & Innovation for Environmental Efficiency	97*	92	2t	High	•	•	•	High	•	•	Yes
Business Ethics & Competitive Behavior	75*	85	4	High	•	•	•	Medium			No
Materials Sourcing	25	77	1	High	•	•	•	High	•		Yes

**HM:** Heat Map, a score out of 100 indicating the relative importance of the topic among SASB's initial list of 43 generic sustainability issues. Asterisks indicate "top issues." The score is based on the frequency of relevant keywords in documents (i.e., 10-Ks, 20-Fs, shareholder resolutions, legal news, news articles, and corporate sustainability reports) that are available on the Bloomberg terminal for the industry's publicly listed companies. Issues for which keyword frequency is in the top quartile are "top issues."

**IWGs:** SASB Industry Working Groups

**%:** The percentage of IWG participants that found the disclosure topic to likely constitute material information for companies in the industry. (-) denotes that the issue was added after the IWG was convened.

**Priority:** Average ranking of the issue in terms of importance. One denotes the most important issue. (-) denotes that the issue was added after the IWG was convened.

**EI:** Evidence of Interest, a subjective assessment based on quantitative and qualitative findings.

**EFI:** Evidence of Financial Impact, a subjective assessment based on quantitative and qualitative findings.

**FLI:** Forward Looking Impact, a subjective assessment on the presence of a material forward-looking impact.

<sup>/1</sup> : During the IWG phase the issue was called "Air Emissions & Waste Management" and its scope included angles covered in this Brief's "Hazardous Waste Management" disclosure topic and angles on Air Pollution which are now not part of any disclosure topic.

## APPENDIX IIB: Evidence of Financial Impact for Sustainability Disclosure Topics

Evidence of Financial Impact	REVENUE & EXPENSES							ASSETS & LIABILITIES				RISK PROFILE	
	Revenue			Operating Expenses		Non-operating Expenses		Assets		Liabilities		Cost of Capital	Industry Divestment Risk
	Market Share	New Markets	Pricing Power	Cost of Revenue	R&D	CapEx	Extra-ordinary Expenses	Tangible Assets	Intangible Assets	Contingent Liabilities & Provisions	Pension & Other Liabilities		
Energy Management				•		•						•	
Hazardous Waste Management				•		•	•			•		•	
Product Safety	•				•		•		•	•		•	
Product Lifecycle Management & Innovation for Environmental Efficiency	•	•	•	•	•		•		•			•	
Business Ethics & Competitive Behavior	•						•		•	•		•	
Materials Sourcing	•			•	•		•		•			•	

MEDIUM IMPACT
  HIGH IMPACT

## APPENDIX III: Sustainability Accounting Metrics | Electrical & Electronic Equipment

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
<b>Energy Management</b>	Total energy consumed, percentage grid electricity, percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	RT0202-01
<b>Hazardous Waste Management</b>	Amount of hazardous waste, percentage recycled	Quantitative	Metric tons (t), Percentage (%)	RT0202-02
	Number and aggregate quantity of reportable spills, quantity recovered*	Quantitative	Number, Kilograms (kg)	RT0202-03
<b>Product Safety</b>	Number of recalls and total units recalled**	Quantitative	Number	RT0202-04
	Amount of legal and regulatory fines and settlements associated with product safety***	Quantitative	U.S. Dollars (\$)	RT0202-05
<b>Product Lifecycle Management &amp; Innovation for Environmental Efficiency</b>	Percentage of products by revenue that contain IEC 62474 declarable substances****	Quantitative	Percentage (%) by revenue	RT0202-06
	Percentage of eligible products by revenue that meet ENERGY STAR® criteria	Quantitative	Percentage (%) by revenue	RT0202-07
	Revenue from renewable energy-related and energy efficiency-related products	Quantitative	U.S. Dollars (\$)	RT0202-08
	Total energy cost savings achieved through energy performance contracts	Quantitative	U.S. Dollars (\$)	RT0202-09
<b>Business Ethics &amp; Competitive Behavior</b>	Description of the management system for prevention of corruption and bribery throughout the value chain	Discussion and Analysis	U.S. Dollars (\$)	RT0202-10
	Amount of legal and regulatory fines and settlements associated with charges of bribery or corruption*****	Quantitative	U.S. Dollars (\$)	RT0202-11
	Amount of legal and regulatory fines and settlements associated with anti-competitive practices*****	Quantitative	U.S. Dollars (\$)	RT0202-12

\*Note to RT0202-03—The registrant shall discuss its long-term activities to remediate spills that occurred in years prior to the reporting period but for which remediation activities are ongoing.

\*\*Note to RT0202-04—The registrant shall discuss notable recalls, such as those that affected a significant number of products or those related to serious injury or fatality.

\*\*\*Note to RT0202-05—Disclosure shall include a description of fines and settlements and corrective actions implemented in response to events.

\*\*\*\* Note to RT0202-06—Disclosure shall include a discussion of approach to managing the use of IEC 62474 declarable substances.

\*\*\*\*\* Note to RT0202-11—Disclosure shall include a description of fines and settlements and corrective actions implemented in response to events.

\*\*\*\*\* Note to RT0202-12—Disclosure shall include a description of fines and settlements and corrective actions implemented in response to events.

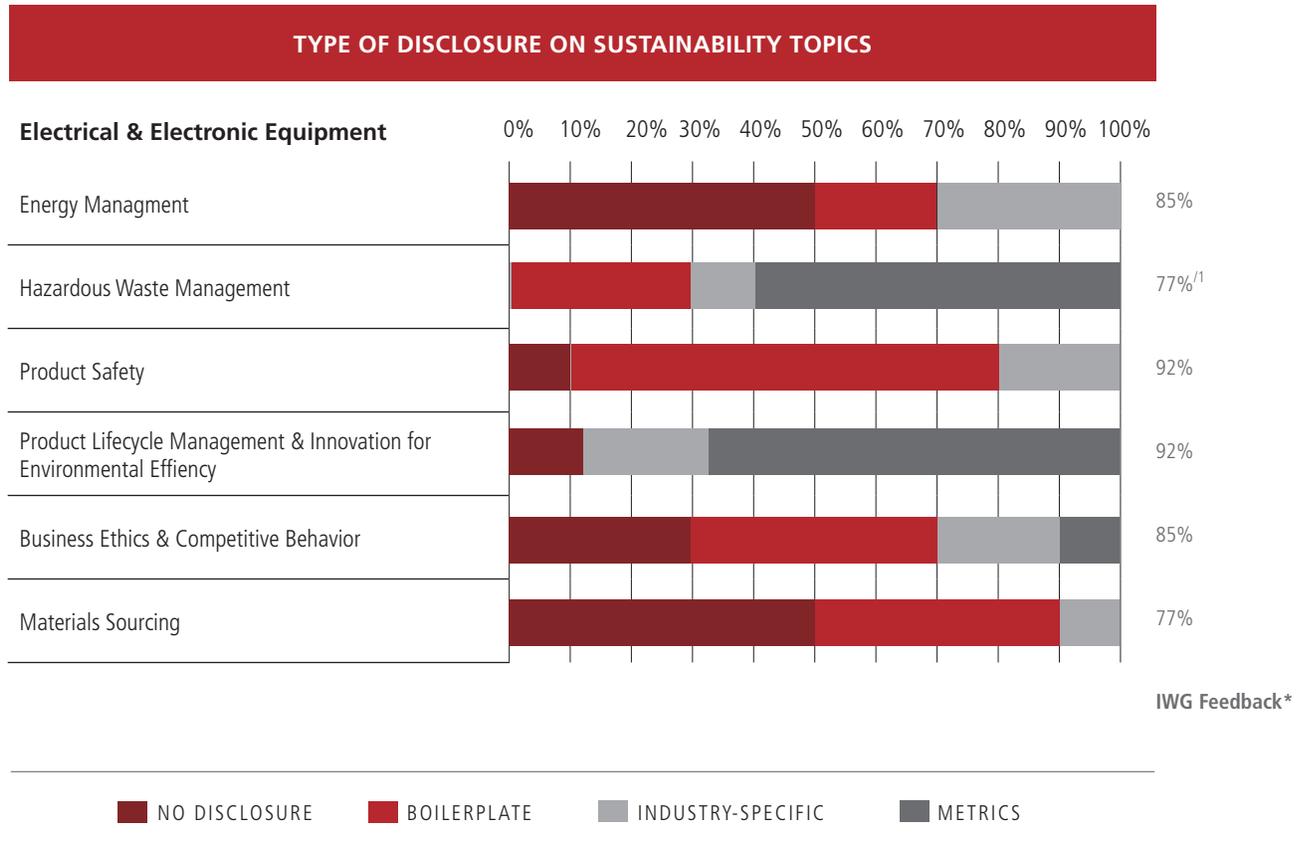
## APPENDIX III:

### Sustainability Accounting Metrics | Electrical & Electronic Equipment Continued

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Materials Sourcing	Percentage of materials costs for products containing critical materials	Quantitative	Percentage (%) by COGS	RT0202-13
	Percentage of tungsten, tin, tantalum, and gold smelters within the supply chain that are verified conflict-free	Quantitative	Percentage (%)	RT0202-14
	Discussion of the management of risks associated with the use of critical materials and conflict minerals	Discussion and Analysis	n/a	RT0202-15

## APPENDIX IV: Analysis of SEC Disclosures | ELECTRICAL & ELECTRONIC EQUIPMENT

The following graph demonstrates an aggregate assessment of how representative U.S.-listed Electrical & Electronic Equipment companies are currently reporting on sustainability topics in their annual SEC filings.



\*Percentage of IWG participants that agreed topic was likely to constitute material information for companies in the industry.

<sup>/1</sup> During the IWG phase the issue was called "Air Emissions & Waste Management" and its scope included angles covered in this Brief's "Hazardous Waste Management" disclosure topic and angles on Air Pollution which are now not part of any disclosure topic.

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