Energy: Industrial Equipment

Sustainable Development Analysis Framework

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Sectors: Companies that produce electrical, mechanical, or hydraulic equipment; Renewable energy systems, and other diverse equipment (printing, machine tools)

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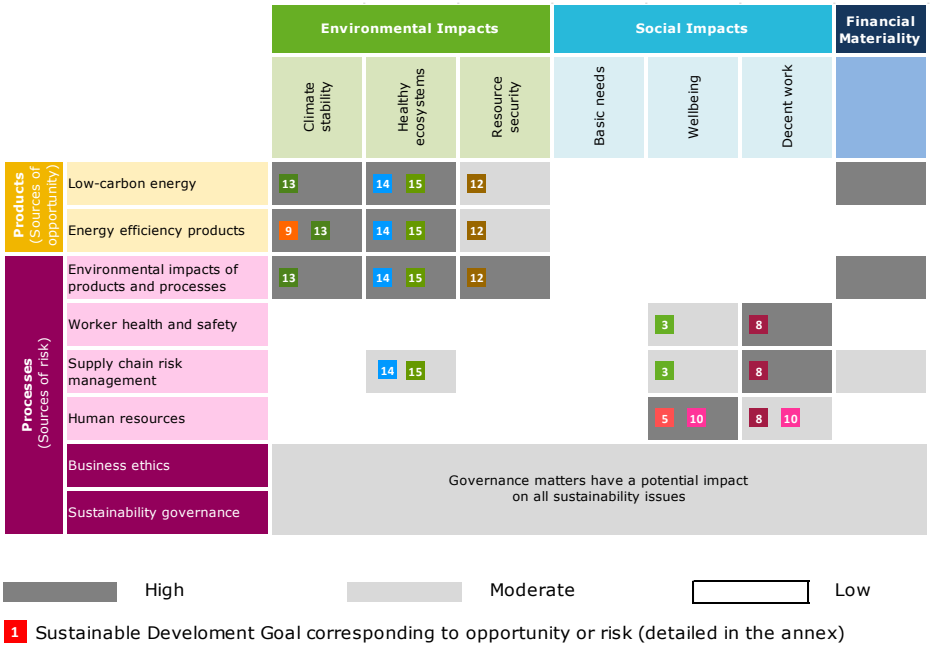
Industrial equipment manufacturers produce goods destined for a variety end-uses and thus must respond to diverse sustainable development challenges. Not only will their products play a key role in achieving decarbonization objectives, but the goods must be produced in a way which respects environmental and social standards throughout the supply chain.

Industrials' face opportunity via activities that lower the environmental impact of the sector itself and/or the sectors which depend on its products. This could include, for example, increasing the energy efficiency of its processes and products, or producing innovative and environmentally-friendly goods which help to mitigate climate change, maintain healthy ecosystems, or protect resources.

Major Sustainability Challenges for the Sector



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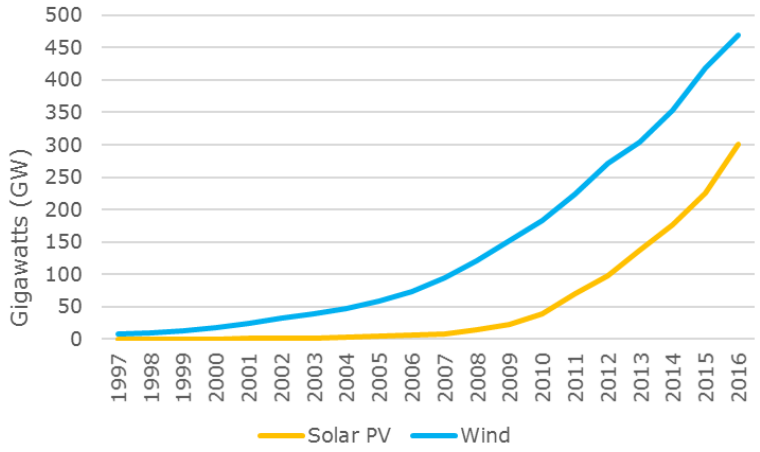
Sustainability Opportunities

E Renewable Energy Systems

Coupled with falling system costs, renewables are beginning to provide an economic and regulatory edge over conventional power generation, and barriers to their widespread implementation are diminishing. Between 2000 and 2016, global solar capacity grew from 1.3 GW in 2000 to 303 GW (IEA, 2016) and wind capacity grew from 17 to 487 GW (Eurobserv'ER, 2017). Increased deployment of renewables implies significantly decreased emissions from the power sector, which is essential for limiting global temperature change to 2°C.

Figure 1: Global Cumulative Wind and Solar Capacity



Source: Mirova / (BP, 2017)

Cost reduction of renewable energy systems – excluding public sector incentives – has been and will continue to be essential for the development of renewable energy. Much of the capital cost reductions come from learning effects, improving industrial processes, and economies of scale. For example, the manufacturing costs associated with solar photovoltaic modules decline about 20% for each doubling of production volume (BP, 2017). Decreasing costs for renewable energy thus depend largely on the industrial sectors' continued investment in the manufacture of these systems.

However, wind and solar depend on intermittent resources and are thus not necessarily suitable for base-load power provision. As a result, companies that develop/manufacture storage and grid management solutions will also help to enable more extensive deployment of renewables.

Geothermal, biomass, and hydropower are mature, stable technologies which neither benefit from learning effects to the same degree as wind and solar nor require adapted grid management solutions. Producers of essential equipment for these energy systems remain highly exposed to environmental opportunity, however, as their products contribute to climate change mitigation.

Overall, climate change mitigation is a subject of ever-increasing regulatory and public focus. As a result, companies that produce renewable energy equipment are less likely to face regulatory penalties going forward, and more likely to financially benefit from the energy transition.

29% of electricity generation in 2040 must come from solar and wind to potentially limit global temperature rise to 2°C according to the International Energy Agency; the share was 3% in 2016

(IEA World Energy Outlook, 2017)

0 grams of CO_2 per kWh are produced by renewable energy sources. Lifecycle emissions range from 8-20 (wind), 29-80 (solar), and 3-85 (hydropower) gCO_2/kWh

(UNEP, 2012)

Companies that produce renewable energy systems (including wind, solar, hydropower, geothermal, and biomass), storage, or grid management solutions constitute investment opportunities.

We look at the percent of revenues and/or capex and the share of R&D budget generated from or dedicated to technologies that promote low-carbon energy.

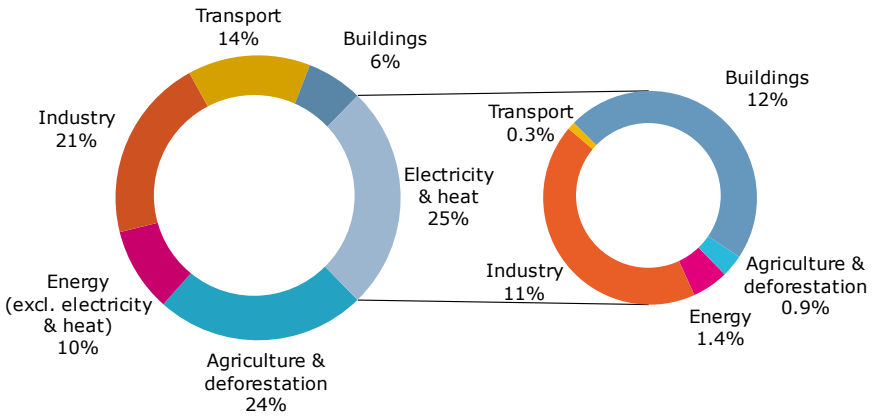
Key indicators

- Percent of revenues and/or capex, dedicated to or generated from the production and sales of low-carbon energy systems and equipment
- Part of the R&D budget dedicated to renewables, storage, and/or energy system improvements for intermittent power sources

E Energy Efficiency of Processes and Products

Industrial companies impact the environment both directly, through their own activities, and indirectly, through the end use of their products.

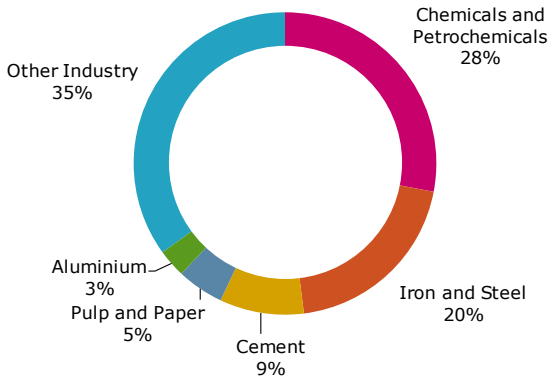
Figure 1: Greenhouse Gas Emissions by Sector



Source: Mirova / (IPCC, 2014)

Industry represents 32% of the world's total greenhouse gas (GHG) emissions, the bulk of which is directly related to its energy consumption. Companies which produce chemicals, cement, paper, steel and metals account for two-thirds of the GHG emissions of the industrial sector alone, as most burn fossil fuels directly within their production processes. The remaining third is divided among industries whose energy consumption is tied to their consumption of electricity. Electricity's importance is increasing: while it accounted for only 30% of industrial energy consumption in the early 1970s, this figure is currently closer to 50% (IPCC, 2014).

Figure 2: Energy Consumption Split in Industry



Source: Mirova / (WRI, 2005)

70% of industrial electricity consumption is linked to the use of electric motors used in pumps, fans, compressors, and other mechanical equipment

(IEA Energy Efficiency Series, 2011) / (EIA, 2013)

Driven by cost-saving targets, the most energy-intensive industries have already made substantial efforts to reduce their consumption. So, the main opportunities to improve energy efficiency lie mostly in the less energy-intensive processes. An estimated 65-70% of industrial electricity consumption is tied to the use of electric motors (IEA Energy Efficiency Series, 2011) (EIA, 2013), indicating substantial potential for improvement through:

- Replacing aging motors with newer, more efficient models.
- Increasing the use of variable speed drives, which adjust the motor's power to the task at hand, to optimize energy consumption
- Global system optimization through greater reliance on sensors and information systems.

Companies which produce efficient motors, variable speed drives, and the like, therefore represent opportunity to decrease energy and electricity consumption via their products. Since these products are used in a variety of applications in a variety of sectors, energy efficient products can have widespread, positive environmental impact.

Finally, more and more industrial players are offering energy consulting services to their customers. This allows the sector to use its portfolio of energy efficient products and technical know-how to optimize the energy efficiency and/or cost savings of its clients, potentially providing cost and environmental benefit for both.

There are two main types of energy efficiency opportunities: (i) consistent in-house improvements to existing systems, processes, and machinery, and/or (ii) manufacture of equipment applicable to other industries that improves their ability to use energy efficiently.

Companies involved in the improvement of energy efficiency through one of these contribute positively to environmental issues and represent investment opportunities.

Key indicators

- Portion of revenues dedicated to energy efficient equipment or energy efficiency solutions
- Capex and/or R&D budget dedicated to energy efficient equipment or energy efficiency solutions

Exposure to Opportunities

	Indicators considered: % of revenues and/or Capex, dedicated to or generated from (i) the production and sales of low-carbon energy systems and equipment (ii) energy efficiency equipment or energy efficiency solutions + % of the R&D budget dedicated to (i) renewables, storage, and/or energy system improvements to facilitate integration of intermittent power sources, or (ii) energy efficient products	
High exposure	>50%	The analysis of the capex and R&D budgets dedicated to the aforementioned activities allows for a more nuanced analysis.
Significant exposure	Between 10% and 50%	
Low or no exposure	<10%	
Negative exposure	>50% coal-dedicated activities	

Environmental and Social Risk

E Environmental Impacts of Products and Processes

As previously stated, as an equipment supplier to many sectors, industrial companies must manage both their own and their products' environmental impacts.

First, companies must mitigate the environmental impacts of their own activities. This can be achieved by reducing greenhouse gas emissions, energy consumption, water pollution, waste production, and use of hazardous materials. Comprehensive, certified environmental management systems, plus short and long-term targets, are essential for companies looking to responsibly manage their environmental impacts while reducing potential reputational and legal risks.

Beyond providing products for the energy transition, companies in the sector should aim to reduce the environmental impact of all their products by implementing eco-design policies. This includes conception of products that use recyclable or biodegradable materials, as well as plans for recycling or responsibly disposing of the product at the end of its useful life.

>99% of the environmental impact of energy-related industrial equipment is due to the use phase

Source: Mirova based on company reports

We look for companies in this sector to reduce the environmental impact of their products through eco-design and to reduce the environmental footprint of their operations via acknowledgement and action regarding climate change (including GHG emissions inventories, targets, action plans, and pursuing improvements in efficiency). The implementation of company policies which focus on environmental management, efficiency, and compliance, including performance indicators, inventories, and quantified objectives regarding key issues (energy use, GHG emissions, water, etc.) are encouraged.

Key indicators

- Formalization: existence of company policies with focus on environmental management, efficiency, and eco-design, including performance indicators, inventories, and quantified objectives regarding key issues
- Performance: evolution of environmental impacts over previous years (GHG / other pollutant emissions, water use, etc.), portion of eco-designed products

S Worker Health and Safety

Industrial work is inherently dangerous, so ensuring a safe and healthy working environment is important for companies that produce and use industrial equipment.

Most industrial accidents take place due to contact with equipment, overexertion, and exposure to harmful substances. Though improvements are being made to proactively manage these risks, ensuring worker (and contractor) health and safety remains key. Frequent health and safety incidents can lead to chronic impacts on company value due to lower morale and productivity, as well as potentially increased regulatory compliance costs and degradation of company reputation.

Whereas many companies within the industry report fatalities and accidents among the workforce, contractors are often excluded from the discussion completely. Since they are less likely to be covered by company health and safety management systems, contractors face greater risk. As a result, implementing management systems for contractors' health and safety is particularly important.

7% *of all fatal workplace injuries are due to manufacturing processes*

(Global Worker Watch, 2014)

Formal health and safety management systems which cover both company employees and contractors must be in place and accompanied by mechanisms to ensure compliance. We look for health and safety policies that include performance indicators and quantified objectives relating to health and safety (health and safety program coverage, employees with access to health and safety education, accident rate, fatality rate, etc.). Low or decreasing accident and fatality rates will attest to the efficacy of these management systems.

Key indicators

- Formalization: existence of a formal health and safety policy covering all workers and contractors, including performance indicators, and quantified objectives relating to health and safety
- Performance: improvement in health and safety performance over the previous years

S Ensuring a Sustainable Supply Chain

Creating a sustainable supply chain can significantly reduce supply, operational, and reputational risk, while potentially reducing cost. However, industrial equipment manufacturers can face sizeable challenges in establishing environmentally and socially responsible supply chains: first, factories are often located in areas where standards and regulation are lower to reduce costs; and second, many different raw materials and secondary inputs can be required to produce even a single piece of equipment, some of which (i.e. conflict minerals, rare earth metals) may be subject to controversy.

5.3 million: *the estimated deaths caused by armed violence in eastern Democratic Republic of Congo, fuelled and sustained by conflict minerals*

(Enough Project, 2015)

So, risks related to human rights, labor rights, safety, and environmental impacts must be carefully monitored and managed, though different supply chains face different levels of intrinsic risk. Wind turbine manufacturers, for instance, depend on relatively uncontroversial and plentiful raw materials, plus their size requires proximity to manufacturing plants to end markets. This ensures consistency of regulation and simplified oversight. Solar modules, however, require chemical processing and are part of a global supply chain. This indicates a need for monitoring the initial steps, which involves hazardous materials and can often take place in locations with limited regulatory oversight.

Monitoring raw material sourcing is especially pertinent when production depends on controversial materials, such as conflict and critical minerals (tantalum, tin, tungsten, and gold). These are essential to produce many types of electronic equipment, metalworking tools, drill bits, and more. Since these minerals can serve to finance armed groups and civil conflicts, decreasing reliance can help to avoid supply chain disruptions or increased costs, reduce negative human rights impacts, and facilitate compliance with new regulations (such as the United States' Dodd-Frank).

Finally, developing a sustainable supply chain is more than just an implementation of environmental and social standards. Though standards are

an important component, developing fair and balanced relationships with suppliers, as with other stakeholders, is also necessary.

Stringent environmental and social supplier standards, in addition to regularly scheduled audits and rigorous compliance mechanisms, ensure that human and labor rights are upheld to a high degree, worker health and safety is prioritized, and environmental impacts are minimized. In addition, we look for companies to avoid procurement of materials from controversial sources to the greatest degree possible.

Key indicators

- Formalization: existence of a policy and indicators pertaining to the supply chain (supplier code of conduct, auditing and verification system, environmental standards, material purchasing policies)

S Human Resources

Large-scale layoffs are prevalent in the industrial equipment sector as profits are squeezed and cost-cutting strategies are executed. Social stability is a prerequisite for long-term growth and companies which value their workers typically report higher levels of productivity and lower employee turnover, so mandatory redundancies can pose financial and social risk.

That said, sometimes restructuring cannot be avoided. When this is the case, providing assistance in finding alternative employment, providing reasonable severance pay, and consulting with unions and employees represent socially responsible restructuring practices.

Companies should endeavor to restructure responsibly when it is not possible to keep existing workers.

Key indicators

- Policies relating to responsible restructuring
- Mechanisms to attract and retain workers

G Business Ethics

Since the overall market and project bidding process for industrial goods can be highly competitive, corruption, market manipulation, and price fixing are rampant within the industry.

These activities can lead to costs and liabilities from regulatory enforcement, criminal or civil sanctions, ongoing compliance costs, recurring fees, negative effects on the company's reputation, and higher costs of capital due to higher risk premiums. Historically, fines for unethical business practices in the sector have ranged from hundreds of thousands to hundreds of millions, depending on the infraction.

Since the laws which exist to limit these behaviors vary by geographical location, each company must bear the responsibility of ensuring that its practices are both ethical and compliant with all applicable laws and regulations. This includes a code of ethics (in local languages), transparency, and concrete methods to guarantee compliance.

We look for companies to exhibit transparency in their activities and to have mechanisms to ensure compliance with ethical standards and regulation. The frequency and severity of controversies indicates the efficacy of the company's overall approach to ethics and its compliance mechanisms.

Key indicators

- Antitrust litigation and fines paid
- Significant ethics controversy and company response

G Sustainability Governance

Democratic governance practices that are attentive to stakeholders can better align shareholders' interests with environmental and social objectives. As a result, these policies can have direct results on a company's performance while demonstrating its commitment to sustainable development.

By integrating sustainability issues at the board level through creating a dedicated CSR committee and incorporating sustainability-related objectives into employee remuneration schemes, companies can more actively include environmental and social considerations in their overall strategy. Facilitating shareholder participation by inviting shareholders to introduce new resolutions and ensuring limited restrictions to voting rights democratizes the process and ensures that stakeholder concerns are well accounted for.

Companies should display high levels of shareholder democracy, including voting rights and the ability to introduce new resolutions. We also look for board compositions which feature separation of power between management and supervisory functions, as well as independent audit, remuneration, and sustainability committees. Finally, integrating environmental and social criteria into the executive management's variable remuneration scheme also represents a good practice for sustainability governance.

Key indicators

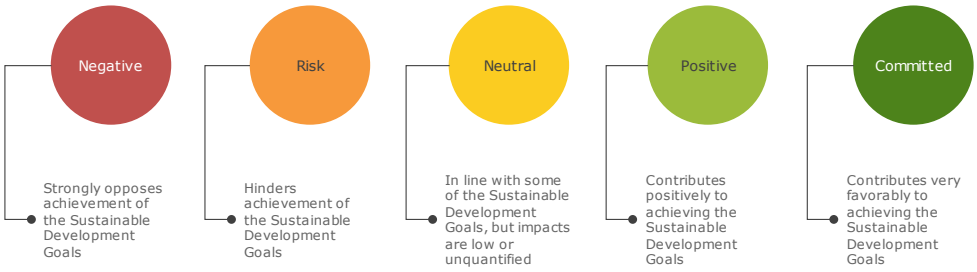
- Presence of sustainability performance indicators and targets within the annual reports
- CSR data incorporated into variable remuneration of the executive Board
- Governance of corporate social responsibility
- Fiscal strategy and tax rate

Risk Assessment

	Criteria
Positive	Does not meet "risk" criteria AND - Comprehensive policy for reduction of environmental impacts: formalization of environmental risk assessment and management procedures, efficiency of operations, verified inventories and closely-followed environmental performance indicators AND - Satisfactory management of worker health and safety AND - Adequate environmental and social standards throughout entire supply chain, plus effective compliance mechanisms AND - Formal policies for responsible restructuring AND - Comprehensive code of ethics plus appropriate response to any controversies
Neutral	All other cases
Risk	- Repeated ethical controversies with insufficient company response OR - Activities with high health/safety risks for workers, and lack of health/safety management (indicators related to health/safety performance) OR - Large-scale layoffs without measures to ensure responsible restructuring OR - Lack of supply chain standards and oversight (often evidenced by involvement in controversies) OR - Activities with significant direct environmental impact and absence of advanced management (following environmental indicators)

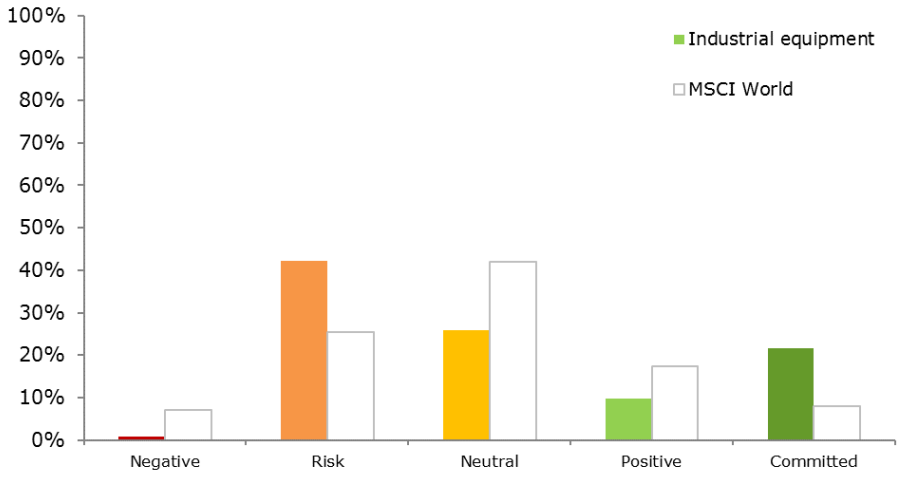
Opinion Breakdown

Based on this framework of analysis, a "sustainability opinion" is defined for each issuer on a scale of five levels.



The following figure illustrates the distribution of Mirova's sustainability opinions for the companies in this sector found in the MSCI World index, compared to the index as a whole.

Figure 1 : Sustainability Opinions of the Industrial Equipment Sector vs. the MSCI World Index



Source: Mirova, 2017

Companies in this sector are more likely to be rated "risk" or "committed" than the broader index, with the opposite true for "positive' and "neutral." In part, this is because companies with environmentally-friendly product portfolios tend be more inclined to appropriately mitigate their ESG risks, whereas companies which produce goods with negative environmental impacts often have limited transparency around sustainability issues.

For example, companies rated "committed" typically feature product portfolios with high environmental benefit and good risk review practices. On the other hand, the high share of companies rated "risk" is due to companies whose products have negative environmental effects (oil and gas exploration and production, coal, etc.), and/or insufficient ESG risk management practices. Many industrial companies are in developing areas with limited regulatory standards for health and transparency, plus the sector is highly exposed to market manipulation and corruption – these factors also contribute to poor risk management of companies in the sector.

Conclusion

As the energy landscape evolves towards a lower-carbon model, manufacturers of industrial equipment will continue to play a major role in the commercialization of clean energy systems and energy efficiency solutions. As a result, the sector is presented with two major opportunities: first, production of equipment which contributes directly to the energy transition, like wind turbines, solar panels, or electrical storage; and second, producing energy efficiency solutions, such as improved manufacturing processes or less energy-consumptive motors, whether for use within the heavy industry sector itself or for application in others.

However, these opportunities must be addressed while negative impacts are minimized. Risks are mainly related to environmental management of processes / products, worker health and safety, supply chain standards, and human resources management.

Environmental management is important for this sector, for both the processes used and the products produced since industry produces a large portion of global GHG emissions and its products (such as steam turbines) produce even more. Hazardous materials and their potential for discharge into the environment must be carefully monitored, and measures to avoid contributing to issues of resource depletion must similarly be undertaken.

On the social side, complicated supply chains must be carefully monitored to reduce negative social impacts. A health and safety management system which covers all employees and contractors is also of paramount importance in this intrinsically dangerous sector.

Finally, it is important to note that companies whose products do not directly address the aforementioned opportunities but make extraordinary efforts to reduce negative environmental and social impacts can still positively differentiate themselves in this way. Conversely, companies which produce equipment in line with the opportunities identified but do not appropriately manage risks will not be eligible for investment.

Sustainable Development Goals

1. End poverty in all its forms everywhere

2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture

3. Ensure healthy lives and promote well-being for all at all ages

4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

5. Achieve gender equality and empower all women and girls

6. Ensure availability and sustainable management of water and sanitation for all

7. Ensure access to affordable, reliable, sustainable and modern energy for all

8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

10. Reduce inequality within and among countries

11. Make cities and human settlements inclusive, safe, resilient and sustainable

12. Ensure sustainable consumption and production patterns

13. Take urgent action to combat climate change and its impacts

14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

http://www.un.org/sustainabledevelopment/sustainable-development-goals/

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