

Working to Create a Brighter Tomorrow



Annual Report on Environmental and Safety Concerns

2019

axcelis

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Introduction

The mission of Axcelis Technologies, Inc. ("Axcelis" or the "Company") is to ensure our customers' success by providing enabling semiconductor manufacturing and support solutions that deliver the best performance at the lowest total cost of ownership. Axcelis' vision is to achieve and maintain market share leadership in ion implantation, and deliver profitability and positive cash flow through the industry cycles to maximize shareholder and employee value.

Beginning in 2019, the VP, EHS and Facilities and Executive VP of Human Resources and General Counsel authored and made available to the public, an Annual Report on Environmental, Safety Concerns ("ARESC"), reporting on calendar year 2018 data. In this, our second, ARES report, reporting on calendar year 2019, we have adopted new disclosures that align with certain aspects of The Climate Disclosure Standards Board ("CDSB") framework, and the Sustainability Accounting Standards Board ("SASB") guidance, using the SASB Semiconductors Standard. In the section below entitled "SASB Sustainability Disclosure Topics & Accounting Metrics," we identify the specific SASB Technology & Communications Standards associated with each disclosure. We expect to continue to adopt additional CDSB and SASB standards in future ARES reports.

Board Governance over Environmental and Safety Risks

Our Board of Directors oversees Axcelis' Environmental, Health and Safety risks and Climate Change risks using our Enterprise Risk Management (ERM) system. The ERM system is a method by which management assists our Board in meeting its risk oversight responsibility.

Annually, management seeks to accurately identify risks that influence our business and rank them by potential severity and by the existence of risk factors beyond the Company's control. Risks with higher severity, or greater uncontrollable factors, are re-assessed by management on a quarterly basis. Climate Change risk is separately identified from Environmental and Occupational Health and Safety compliance risks, given its higher uncontrollable factors. Trends and mitigation actions on these higher risks are reported to the Board quarterly. This ARES report is also provided to the Board each year.

Environmental and Occupational Health and Safety Goals and Management Systems

The Axcelis executive officers and the VP of Environmental, Health and Safety (EHS) and Facilities (the "Leadership Team") are responsible for setting and reviewing annual Occupational Health and Safety and Environmental objectives, targets, and goals.

These objectives, targets and goals are designed to appropriately control the Occupational Health and Safety risks and minimize the environmental impacts of Axcelis' activities, products and services, including Axcelis' contribution to Climate Change. Our annual objectives, targets and goals are incorporated into our EHS Management Systems each year, and progress against these goals, as well as review of the effectiveness of the Management Systems, is conducted on a quarterly basis as a portion of Axcelis' business-wide Quarterly Business Review.

Axcelis Environmental and Health and Safety Policies

Axcelis is committed to achieving our business mission while protecting the environment and the public health of the communities in which we operate. These commitments include:

- Compliance with all environmental regulations, legislation, and other environmental requirements applicable to our business and its environmental aspects.
- Conservation of natural resources.
- Continual improvement of our environmental management systems.
- Setting appropriate, achievable objectives and targets for the prevention of pollution.
- Periodically reviewing our environmental objectives and targets.
- Maintaining records regarding environmental policies, procedures, and performance.

Axcelis understands that achieving our business mission depends, ultimately, on the sustained high performance of our employees. This is dependent, among other factors, on the maintenance of a high level of employee health and safety. In support of this principle, Axcelis is committed to the following:

- Preventing occupational injuries and illnesses to our employees, visitors and contractors.
- Compliance with all occupational health and safety regulations, legislation, and other requirements applicable to our business and its Occupational Health & Safety ("OH&S") hazards.
- Continual improvement our OH&S management and performance.
- Setting appropriate, achievable objectives and targets for the prevention of occupational injuries and illnesses.
- Periodically reviewing our OH&S objectives and targets.
- Maintaining records regarding OH&S policies, procedures, and performance.

These commitments are included in Axcelis' OH&S and Environmental policies, which are communicated to all personnel working at Axcelis facilities. Axcelis also has required training for employees and others on environmental and safety topics. In addition, Axcelis' OH&S and Environmental policies are included in Axcelis' Supplier Code of Conduct. All direct suppliers as well as other companies in our supply chain are expected to comply with these policies as if they had adopted them directly.

Axcelis ISO Certifications

Axcelis has been registered to the ISO 14001 Environmental Management Systems standard since 2000. It is currently registered to the ISO 14001:2015 version of the standard with an expiration date of February 24, 2022. The scope of Axcelis' ISO certification is "All activities for the manufacture of semiconductor manufacturing equipment and similar products at the headquarters plant at 108 Cherry Hill Drive, Beverly MA."

Axcelis has been registered to the ISO 9001 Quality Management System standard since 1999. Axcelis' Health and Safety Management System is run under the Business Support Infrastructure portion of our

Quality Management System. The Axcelis Health and Safety Management System is based on the principles outlined in the OSHAS 18001 and ISO 45001 HSMS standards.

Controlling Axcelis' Impact on the Environment

Each year, Axcelis identifies and evaluates the environmental aspects of our activities, as well as planned, new or modified products and services that it can control and influence to determine those that may have a significant impact on the environment. These are referred to as "environmental aspects." When determining environmental aspects, Axcelis takes into account abnormal conditions and reasonably foreseeable emergency conditions. Certain environmental aspects are identified as "Significant Environmental Impacts." Axcelis conducts quarterly evaluations to ensure that the identification and current performance of Significant Environmental Impacts are understood.

Axcelis' Significant Environmental Impacts are:

- Electricity Consumption.
- Natural Gas and other Fuel Consumption.
- Fossil Fuel Consumption from Employee Commuting.
- Contribution to Global Climate Change.

Axcelis sets goals and tracks performance for our Significant Environmental Impacts and other environmental factors, including water, waste and air emissions, all of which are discussed below.

SASB Sustainability Disclosure Topics & Accounting Metrics

Organizational Boundary

In this report, Axcelis is sharing key environmental performance indicators only for its corporate headquarters and sole factory operations in Beverly MA ("Axcelis Headquarters"). While Axcelis maintains field service and sales offices near customer sites throughout the US, EU and Asia, and a small UV bulb manufacturing operation in Rockville MD, Axcelis estimates that the total of all of these other locations accounts for less than 10% of Axcelis' total emissions and natural resource consumption. For many of these non-headquarters locations, it is difficult to accurately assess the quantities of resource consumption such as fuel burning for heating or water use, as the locations are not directly metered, and billing for these services is often assessed on a percentage of space occupied in shared facilities.

Greenhouse Gas Emissions (TC-SC-110a.1)

Axcelis recognizes that emissions from our operations contribute to Climate Change. Axcelis supports the goals of the Paris Agreement made under the United Nations Framework Convention on Climate Change. Axcelis is committed to measuring and minimizing the impact that our operations have in this area, where feasible. To do this, Axcelis uses the Greenhouse Gas ("GHG") Protocol Corporate Standard, the international standard for corporate GHG accounting and reporting. The GHG Protocol classifies a company's GHG emissions into three "Scopes." Scope 1 emissions are direct emissions from owned or controlled sources. Scope 2 emissions are indirect emissions from the generation of purchased energy. Scope 3 emissions are all indirect emissions (not included in Scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.

Axcelis tracks 100% of our Scope 1 and 2 emissions for Axcelis Headquarters. Axcelis has goals to ensure our Scope 1 emissions are minimized to the greatest extent practical. As a part of our effort to reduce fuel burning, Axcelis has replaced one of our boilers with two high-efficiency heating units. In addition to direct

fuel burning, Axcelis Scope 1 emissions include fugitive emissions of perfluorinated process chemicals (“PFCs”) used in manufacturing our products. Axcelis has greatly reduced our use of these materials and has instituted a means of recycling Sulfur Hexafluoride (SF6) gas used in the final test process of Axcelis high-energy implanters. As a result, Axcelis has reduced our Scope 1 emissions from a high of 9,689.64 metric tonnes of Carbon Dioxide equivalents (CO2e) in 2011 to 3,076.75 metric tonnes of CO2e in 2019. This constitutes a 68.25% reduction in nine years.

In 2019, Axcelis Headquarters’ gross total Scope 1 GHG Emissions were 3,076.75 metric tonnes of CO2e. This includes 2,407.3 metric tonnes of emissions from Fuel Burning including CO2, N2O and CH4, and 669.45 metric tonnes of CO2e from SF6 emissions. Axcelis Headquarters did not have any emissions of HFCs, PFCs, or NF3 in 2019. When normalized using total revenue of \$343.0 million from 2019, total Scope 1 emissions were 8.97 metric tonnes per \$million in revenue.

In 2019, Axcelis Headquarters’ total Scope 2 GHG Emissions were 5,901.07 metric tonnes of CO2e. When normalized using total revenue of \$343.0 million from 2019, Total Scope 2 emissions were 17.2 metric tonnes per \$million in revenue.

Note: conversion factors from the Massachusetts eDEP GHG reporting system were used to determine CO2e from all sources.

Greenhouse Gas Emissions Discussion (TC-SC-110a.2)

Axcelis has adopted the CDSB Climate Disclosure Pillars to ensure we are comprehensively addressing the risks and opportunities of Climate Change.

Climate Disclosure Pillars

Governance	See “Board Governance over Environmental and Safety Risks” above. Climate Change risk is included in Enterprise Risk Management system and is reviewed quarterly by senior management and our Board of Directors
Strategy	<ul style="list-style-type: none"> • Take appropriate steps to reduce Axcelis’ contribution to Climate Change • Adjust business practices to changing climate realities • Meet customer expectations for product performance relative to Climate Change • Capitalize on business opportunities connected to Climate Change
Risk Management	<ul style="list-style-type: none"> • Proactively reduce Greenhouse gasses • Monitor climate risks to business objectives, and adjust accordingly
Metrics and Targets	See metrics, above in section TC-SC-110a.1.

Axcelis continually monitors the energy marketplace for opportunities to obtain or enable low carbon energy production. We continue to consider the return on investment from the potential installation of solar energy panels at Axcelis Headquarters, but have not yet found it significantly attractive, due in part to the period of time remaining on our lease of the facility. However, Axcelis is in the process of establishing an agreement for Alternative On-Bill Credit for 50% of the proposed output of an offsite community solar project planned under the Massachusetts SMART program. Although Axcelis will not directly use the electricity generated by the project, Axcelis believes our participation will help to enable the growth of solar power within the Commonwealth of Massachusetts.

Energy Management in Manufacturing (TC-SC-130a.1)

Axcelis continually strives to reduce our electricity consumption at Axcelis Headquarters, which includes our manufacturing and product demonstration facilities. Past projects include:

- Conversion from incandescent and fluorescent lighting to Smart LED lighting throughout the facility and parking areas.
- Optimization of clean room HVAC systems.
- Chiller optimization to take advantage of “free (cooling tower based) cooling” during periods of colder weather.
- Use of variable frequency drives where appropriate.

In June 2019, Axcelis began operation of a 250 kW Combined Heat and Power (“CHP”) plant. This CHP plant is expected to reduce our electricity consumption from ISO-New England (the independent, not-for-profit corporation providing electricity across the six New England states), by more than 1.9 Million kWh per year.

Axcelis Headquarters consumed 68,112.96 gigajoules of total energy in 2019. Of this, 64,295.77 gigajoules of energy (94.4%) came from the ISO New England grid, none of which energy qualified as renewable. 3,817.19 gigajoules were generated onsite at the Axcelis Headquarters in a 250 kW capacity combined heat and energy plant.

Water Management (TC-SC-140a.1)

Axcelis Headquarters uses water for evaporative cooling, laboratory processing, aqueous cleaning, our cafeteria operations, and other domestic uses. Occasionally, water is added to our closed loop chilled water and process cooling systems.

Axcelis Headquarters withdrew 46,668 thousand cubic meters (11,271,612 gallons) of water in 2019. Based on information obtained from the Aqueduct Water Risk Atlas (<https://wri.org/applications/aqueduct/country-rankings/?country=USA&indicator=bws>), none of this water was withdrawn from a region with high or extremely high baseline water stress. We reduced our total consumption at Axcelis Headquarters by 7.5% from 2018 and by 16.5% since 2017.

Of the total water usage at Axcelis Headquarters in 2019, 52% was lost to evaporation from our evaporative cooling towers serving our chilled water plant.

Axcelis recognizes that water is a vital natural resource and makes efforts to minimize water use where appropriate. At Axcelis Headquarters, we generate industrial wastewater that is pretreated for metals precipitation and for non-metals pH adjustment, and then discharged to the South Essex Sewerage District, a publicly owned treatment works serving Beverly, Danvers, Salem, Peabody and Marblehead, MA.

In 2019, Axcelis modified the deionized water rinse used in our manufacturing operations for aqueous cleaning systems. We now only add water if needed based on an increase in conductivity, or a low level in the rinse tank as a result of evaporation of the 130-degree rinse water. In 2019, Axcelis treated 90,459 gallons, a 53% reduction from 191,669 gallons of industrial wastewater in 2018. The remaining water was used within the plant, mainly for domestic and cafeteria operations.

Waste Management (TC-SC-150a.1)

Axcelis Headquarters is a Small Quantity Generator of Hazardous Waste according to the regulations of the MA Department of Environmental Protection (MA DEP) found in 310 CMR Part 30. In 2019, Axcelis Headquarters generated 5.49 metric tonnes of federally regulated and MA regulated Hazardous Waste combined. In addition, 0.68 metric tonnes of Universal Waste were diverted from hazardous waste streams for recycling.

Including Universal Waste, 11.0% of all hazardous waste was diverted to recycling.

Employee Health and Safety (TC-SC-320a.1)

The Axcelis Health and Safety Management System is based on the principles outlined in the OSHAS 18001 and ISO 45001 HSMS standards. As such, our system is intended to result in continual improvement of employee health and safety performance, fulfilment of legal and other requirements, and achievement of employee health and safety objectives.

Major components of our system include top management leadership and commitment, consultation and participation of workers, identification of hazards and controls, risk assessment, evaluation of opportunities for improvement, establishing plans and objectives and targets for continuous improvement, documentation of policies and procedures, communication, training and awareness on health and safety matters, performance evaluation, periodic compliance audits, and management review.

In 2019, Axcelis worldwide OSHA recordable incident rate equivalent (applying US OSHA recordable criteria to all employees regardless of country) was 0.40 recordable incidents per 100 full time employee equivalents. Over the last five years, our average incident rate was 0.7 recordable incidents per 100 full time employee equivalents.

Axcelis invests heavily in EHS training for our global work force. In 2019, Axcelis successfully delivered 12,785 individual EHS, HR, Legal and Ethics training courses through our online Learning Management System. Monthly reports regarding training performance of all employees are sent to the Leadership Team. In order to drive timely completion, our CEO directly contacts employees with low training completion rates to reinforce the importance of completing assigned training on time. Training completion is also included in our annual employee performance review process. In 2019, employees completed 99.5% of all training assignments that were due on or before year-end.

Other OHS metrics are tracked and reviewed with the Leadership Team on a quarterly basis. These metrics include the number of days a corrective action related to an accident or other incident is open before resolution, and the number and content of health and safety communications delivered to employees.

Employee Health and Safety (TC-SC-320a.2)

Axcelis has experienced no legal proceedings associated with employee health and safety violations in more than 5 years, and thus has incurred no monetary losses as a result.

Recruiting & Managing a Global & Skilled Workforce (TC-SC-330a.1)

Our business depends on our ability to attract and retain qualified, experienced employees, including foreign nationals. US employment of foreign nationals requires compliance with US immigration laws, which Axcelis strictly adheres to, and participates in the US government's Everify program to ensure all US employees are authorized to work in the country. Employment of individuals outside of the US is required to meet our business and customer obligations. Axcelis manages risks in offshore employment, such as compliance with non-US laws and regulations, by employing experienced Human Resources and Finance staff in the applicable country, and accessing external legal counsel and other experts as needed.

Product Lifecycle Management (TC-SC-410a.1)

All of Axcelis' products include at least some IEC 62474 declarable substances.

Chemicals on the list of IEC 62474 declarable substances applicable to Axcelis' products are regulated by EU Registration, Evaluation, and Authorization of Chemicals (REACH) Regulation (EC/1907/2006), EU Regulation No 517/2014 on fluorinated greenhouse gases (EU F-Gas), EU Restriction of Hazardous Substances Directive 2011/65/EU (EU RoHS) and its amendments, or the Law on Measures for Restriction of the Use of Hazardous Substances in Electrical Appliances and Electronic Products (China RoHS).

Axcelis maintains compliance programs for all of the regulations listed above. As a component of our EU REACH compliance program, Axcelis provides web-based reporting to our customers on Substances of Very High Concern ("SVHCs") or Candidate List Substances, known to be included into our products. We monitor the inclusion of SVHCs in our products from purchased parts and components, and require our suppliers to notify us if SVHCs (regardless of the amount or concentration) are included in parts and components they sell to Axcelis.

Axcelis incorporates OEM chillers into our products that contain limited amounts of refrigerants regulated by the EU F-Gas regulation. Axcelis has made efforts to minimize the quantities of F-Gas refrigerants in the chillers we select to be incorporated into our products. For chillers that are shipped into the EU, Axcelis or its customers utilize the 100 tonnes per year of CO2e exemption for the F-Gases included in the chillers.

Since our products are considered Large Scale Stationary Industrial Tools (LSIT) under EU RoHS, Axcelis' products are exempt from EU RoHS requirements. Axcelis maintains a China RoHS compliance program and discloses reportable content and applies product labeling in conformance with the China RoHS regulation.

Product Lifecycle Management (TC-SC-410a.2)

The quantitative metrics listed in SASB's Technology & Communications Standards for product life cycle management are not applicable to ion implantation systems or associated products.

Axcelis is committed to delivering safe and effective products to our customers. Many of our customers actively solicit continuous improvement in both the safety and environmental impact of our ion implantation systems. Each Axcelis product is evaluated against guidelines published by our trade organization, SEMI (formerly Semiconductor Equipment and Materials International). SEMI's guideline S2, called "Environmental Health and Safety Guideline for Semiconductor Manufacturing Equipment," requires a review of equipment by a third party evaluator which, based on the results of the evaluation, certifies that the product is in conformance to the guidelines outlined in the SEMI document.

Axcelis also ensures that our products comply with all environmental and safety laws and regulations applicable to our systems, in the countries in which our systems are located. Our customers use our systems in the United States, Europe and Asia. The European Union has taken a leadership role in safety regulation, and Axcelis ensures its systems comply with the European Union's Machinery Directive

(2006/42/EC) and the Directive's "Essential Health and Safety Requirements relating to the Design and Construction of Machinery," as well as the European Union Electromagnetic Compatibility (EMC) Directive (2014/30/EU).

Axcelis evaluates the use of utilities by our ion implantation systems according to the SEMI guideline S23, "Guide for Energy, Utilities, and Materials Use Efficiency of Semiconductor Manufacturing Equipment," and continually looks for process improvements to reduce the consumption.

Materials Sourcing (TC-SC-440a.1)

Axcelis relies to a substantial extent on outside vendors to manufacture many of the components and sub-assemblies of our products. Some of these components and subassemblies contain critical materials as defined by the National Research Council. We obtain many of these components and sub-assemblies from a limited group of suppliers. Axcelis manages its supply chain on a constant basis in order to ensure appropriate and timely access to the components and sub-assemblies necessary to manufacture our products. As needed to reduce or address risk, we seek alternative sources of supply or decide to manufacture components or subassemblies internally.

Intellectual Property Protection & Competitive Behavior (TC-SC-520a.1)

Axcelis has experienced no legal proceedings associated with anti-competitive behavior regulations in more than 5 years, and thus has incurred no in monetary losses as a result.

Total Production (TC-SC-000.A)

While Axcelis does not publicly report the number of ion implanters shipped per year. Revenue for 2019 was \$343.0 million, of which systems revenue was \$202.6 million. Beginning with this report, Axcelis' total annual revenue is used as a denominator for normalizing annual Greenhouse Gas Scope 1 and Scope 2 emissions for comparison against our own performance and the performance of peers.

Percentage of production from owned facilities (TC-SC-000.B)

Axcelis produced 100% of its products from facilities leased and operated by Axcelis.