

# Lam Research Corporation Environmental Sustainability Guide 2012



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Lam Research Corporation is a major supplier of wafer fabrication equipment and services to the worldwide semiconductor industry, where we have been advancing semiconductor manufacturing for more than 30 years. With the ongoing and growing demand for feature-rich consumer products, chipmakers are challenged to mass produce highly sophisticated devices. To keep pace and meet challenging production requirements of semiconductor manufacturers, Lam Research continues to invest in new product development through R&D and acquisitions.

In October 2006, Lam research acquired Silfex, formerly a division of Bullen Ultrasonics. Silfex provides silicon growing and fabrication capabilities; in addition, Silfex supplies high-purity custom silicon components and assemblies to a broad base of high-technology markets, including semiconductor test, solar and optical. Acquisition of SEZ Group in March 2008 added the capabilities and access to an installed base of SEZ's pioneering single-wafer spin clean technology.

Lam's recent merger with Novellus Systems, Inc., has created a broad portfolio of complementary product capabilities that includes Lam's leadership in etch and single-wafer clean and Novellus' leadership in thin film deposition and photoresist strip. The combined company is well positioned to lead the global semiconductor industry through the next critical technology transitions, including 3D structures in advanced devices and scaling to 450 mm wafers.

With corporate headquarters located in Fremont, California, the Company maintains a network of facilities throughout Asia, North America, and Europe to meet the complex and changing needs of its global customer base.

This Environmental Sustainability Guide communicates Lam Research Corporation's program policy, commitment, performance and goals with a focus towards future improvements.

### Mission

Lam Research is dedicated to the success of our customers by being the world-class provider of innovative technology and productivity solutions to the semiconductor industry.

### Vision

- Number one in customer trust
- Number one in market share
- A company where successful people want to work
- Best-in-class products and services
- Financial performance to:
  - Fund the solutions our customers require
  - Provide the return our shareholders expect

## Environmental, Health, Safety & Sustainability

Lam Research is committed to integrating environmental sustainability as a key component of our business processes and to the continual improvement in environmental protection, pollution prevention and regulatory compliance in our business activities. By doing so Lam Research will benefit our customers, employees and communities we serve.

Further, Lam Research is committed to manage health, safety and the environment (EHS) as a core business principle to ensure compliance with applicable government standards and regulations and provide a safe and healthful workplace, while reducing our environmental footprint. We integrate health, safety, and environment into all aspects of our businesses, including products we design and services we provide, to afford our customers and Lam with enhanced productivity and responsible solutions by:

- Striving for zero accidents through the application of an EHS Management System philosophy
- Implementing pollution prevention control strategies supported by ISO 14001 system
- Commitment to continual improvement for our customers, company, and Lam personnel

Lam Research has been registered to the international Environmental Management System standard, ISO 14001 since 2003, is a Charter Member of SEMI® Global Care™, and maintains reports of EHS performance. Lam's aggressive safety program has resulted in one of the lowest injury rates industry-wide. Employee safety is our highest priority. For information about Environmental Health & Safety at Lam Research, please email [ehs@lamresearch.com](mailto:ehs@lamresearch.com).

### Governance

We encourage our employees to embrace our core values and play a key role in carrying out our policy. In addition, we leverage our Environmental, Health and Safety Management Systems to ensure our business processes are rooted in environmental sustainability.

### Core Values

What we believe, practice and reward

- Achievement
- Honesty and Integrity
- Innovation and Continuous Improvement
- Mutual Trust and Respect
- Open Communication
- Ownership and Accountability
- Teamwork

## Global EHS & Sustainability Commitment Policy

Lam is committed to manage health, safety, and environment as a core business principle to ensure compliance with all applicable government standards and regulations. We integrate health, safety and environment into all aspects of our businesses including products we design to provide our customers and our company with enhanced productivity and responsible solutions.

Our EHS Management Systems reflect Lam's Core Values and supports meeting Lam business objectives.

**EMPLOYEES AND OPERATIONS** – We will protect the safety and health of our employees and minimize our environmental footprint through prevention of illness, injury and environmental impact. All employees shall be personally involved in furthering this objective.

**SOLUTIONS FOR CUSTOMERS AND SUPPLIERS** – Health, safety and environment concerns are integral to our processes, services and product designs, including responsible management throughout our product lifecycle. We educate customers, suppliers and the public about the safe use of our products and openly communicate the protective measures we take for employees, our communities and other key stakeholders.

**ACCOUNTABILITY** – We utilize environmental, health and safety management systems to apply global standards, including compliance with applicable laws and regulations and other standards to which we subscribe. Our executives and managers are measured and held accountable for the safety and environmental performance of the business. We hold every employee accountable for his or her role in meeting our commitment.

**STAKEHOLDER INVOLVEMENT** – We work with stakeholders in the development of the laws, regulations and standards that safeguard the community, workplace and environment. As a responsible corporate citizen, we demonstrate this commitment by working within our communities and actively pursuing independent certifications and recognition, as appropriate.

**CONTINUOUS IMPROVEMENT** – We address occupational injuries and illnesses, emissions, wastes and inefficient use of resources and energy as preventable process defects. We continuously improve our environmental, health and safety management system and work collaboratively with suppliers and customers to deliver solutions that meet business and environmental, health and safety objectives.

## Environmental Sustainability Impacts

Recognizing the environmental impact of our company is critical to understanding how we can operate our facilities more efficiently and develop products and technologies to benefit our customers and our stakeholders. We have identified the following metrics as key indicators of our progress towards our environmental sustainability initiatives at our facilities:

### Greenhouse Gas (GHG) Emissions

In 2011, we continued to refine and further understand our Scope 1 and Scope 2 GHG emissions inventory as well as limited Scope 3 emissions. Our Scope 1 and 2 GHG emissions inventory include emissions from use of perfluorocarbons (PFCs) in our processes and R&D activities, and energy consumption. We expanded the scope of our GHG inventory to include contributions from Silfex's Ohio facility. In 2012, we will begin to determine the inventory and contribution from the Silfex's Suzhou facility. Additionally, the acquisition of Novellus (including Peter Wolters AG) will expand our baseline scope even further. Calendar year 2010 is designated as our baseline year against which to measure future improvements; this baseline may be adjusted for additional contributions and opportunities from Silfex and Novellus.

### Energy

Across our global manufacturing facilities, our primary energy usage is associated with electricity and natural gas consumption. Tracking these utilities allows us to analyze trends across our facilities, and leverage this information to highlight potential areas for improvement initiatives. We undertook various projects to improve our facilities infrastructure in 2011 with efficiency benefits to be gained. In August 2011, our Villedach facility began to purchase 100% of its electricity from renewable sources, reducing the carbon emissions to zero and reducing associated emissions from radioactive waste generation by our electricity supplier. In 2012, we initiated a global Energy Team to leverage best practices between sites as well as share project results and how reduction or efficiency gains were achieved.

### Health and Safety

The health and safety of our employees is critical to the success of our facility operations and overall sustainable performance of our business. Lam's aggressive safety program has resulted in one of the lowest injury rates industry-wide.

### Hazardous Waste

Hazardous wastes are generated as a result of our operations. These waste streams are managed and tracked for regulatory compliance, as well as for cost accounting. In 2011, we began to re-evaluate hazardous waste streams and identify potential recycling or alternative disposal options.

### Solid Waste (Nonhazardous)

Solid waste generated at our facilities is sorted to segregate recyclable materials and divert from disposal in landfills. We have established guidelines to determine solid waste characteristics in compliance with local requirements to ensure appropriate recycling and proper disposal. Lam Research's Fremont and Livermore operations were recognized environmentally-friendly business practices by CalRecycle with a Waste Reduction Award for 2011.

### Recycling

Recyclable materials are segregated from waste generated at our facilities. These recyclable materials include metal, glass, plastic, paper, cardboard, wood, and other solid waste. Lam has been able to improve our landfill diversion rate to 74% for the combined manufacturing sites in 2011; for our core business of semiconductor equipment manufacturing sites, the diversion rate improved to 83% in 2011.

### Water

We use water domestically (restrooms, cafeteria), landscape irrigation, and in production and R&D of our core products. Water, in particular clean water, is an important commodity in our industry for use in cleaning, developing processes and manufacturing of our products.

## Sustainability Scorecard

We use our scorecard as a way to baseline and understand the ongoing performance of our facilities with regard to environmental sustainability. This scorecard is the culmination of data collection since 2006. It is important to note that our facility footprint has grown over the course of this data collection, affecting consumption figures.

	2006 <sup>(1)</sup>	2007	2008 <sup>(2)</sup>	2009	2010 <sup>(3)</sup>	2011 <sup>(4)</sup>
<b>GHG Emissions<sup>(5)</sup></b>						
Scope 1 Emissions (MTCO <sub>2</sub> e)	~	~	~	~	15,248	30,882
Scope 2 Emissions (MTCO <sub>2</sub> e)	~	~	~	~	14,662	56,360
Scope 3 Emissions (MTCO <sub>2</sub> e) <sup>(6)</sup>	~	~	~	~	23,674	20,826
<b>Energy<sup>(5)</sup></b>						
Electricity (MWh)	32,524	35,219	44,392	42,007	44,731	134,791
Natural Gas (MWh)	10,674	15,019	13,733	11,718	12,692	31,987
<b>Waste<sup>(5)</sup></b>						
Hazardous Waste (Metric tons)	11	235	1,655	1,015	310	1,765
Solid Waste (Metric tons)	446	516	391	489	461	694
<b>Water<sup>(5)</sup></b>						
Water Usage (Cubic meters)	166,688	199,941	232,547	195,422	183,253	2,562,879
<b>Recycling<sup>(5)</sup></b>						
Mixed Media (Metric Tons)	528	625	513	421	1,046	1,221
Diversion Rate (%)	54	55	57	46	69	72
<b>Health and Safety<sup>(7)</sup></b>						
Total Case Incident Rate per 100 employees (TCIR)	1	0.7	0.7	0.8	1.1	0.4
Total Lost Workday Case Incidence Rate per 100 employees (LWCAIR)	0.1	0.2	0.3	0.3	0.8	0.2

(1) = 2006 and 2007 Figures represent only our facility in Fremont, California.

(2) = In 2008, Lam acquired Austrian SEZ AG. The full calendar year's data is included in these figures.

(3) = 2010 is the baseline year for Lam GHG emissions.

(4) = In 2012, Lam acquired Novellus; however, 2011 calendar year for both Lam and Novellus are included. In addition, contributions from Silfex-OH are included in these figures.

(5) = These are absolute figures.

(6) = Scope 3 emissions include a portion of Lam employee travel and commute.

(7) = Health and safety 2011 metrics for Lam, excluding Silfex and Novellus acquisition.

## Demonstrating Our Commitment

We have a long standing commitment to environmental responsibility in our products, our operations and our culture. Our efforts embody our concern for the environment, our employees, and the continued success of our company. Some of our recent initiatives to foster sustainable growth include:

### Infrastructure Upgrades

We continue initiatives to install lighting controls including motion detectors, timers, and LEDs for outdoor lighting to eliminate energy waste. We have upgraded and adjusted our HVAC systems to coincide with peak demand, saving electricity consumption. In the past two years we have seen benefits from upgrading cooling towers and boilers at our manufacturing facilities. Most recently we have installed more efficient water pumps in our process cooling systems and will be upgrading process cooling chillers. Savings are already being seen in consumption figures as a result of these efforts.

### Water Savings

In 2011, we pursued and evaluated potential process water and grey water re-use at our Fremont facility; these projects were not implemented due to technical and regulatory constraints. We continued to upgrade and install high efficiency water fixtures in our facility's restrooms as well as optimize landscaping water usage, which will ensure further savings. We are continuing to look into water use reduction possibilities in our facilities infrastructure systems, such as cooling towers and wet scrubbers.

### Recycling Program

In 2010, Lam implemented a new recycling program which took a fresh look at our methods. In 2010, the average landfill diversion rate rose from 49% to 74% and we saw increased cost savings. In 2011, the landfill diversion rate reached 83% with additional material segregation and equipment to shred and compact foam packaging for recycling.

Lam introduced a shuttle service program called LRide in December 2010 to help employees commute to work and between sites without having to rely on their personal vehicles or waste time sitting in traffic. The shuttle operates between San Jose and the Fremont and Livermore campuses; with the Lam and Novellus merger, service between Fremont and the Novellus campus has been added in 2012. The shuttles feature Wi-Fi and free parking for riders.



In conjunction with Enterprise Car Rental, WeCar operates as an onsite, membership-based car rental service utilizing 6 Nissan Altima hybrids. It is designed to facilitate inter-site business travel during the time period not covered by regular LRide service.



## Future Goals, Objectives, Measures

Lam Research has set goals to drive opportunities that exist within each facility to reduce our environmental impacts. We have explored and implemented a number of initiatives to responsibly manage and conserve resources in line with our global environmental sustainability policy. While we are early on in this process, we believe we can achieve the following goals by driving a consistent focus on these initiatives across the organization. As we learn more, our teams will work to refine and confirm these targets over the course of 2012.



### **Reduce GHG Emissions by 3% from 2011 to 2014**

The objective for near-term GHG performance is to improve and substantiate the methods used to collect GHG data. We plan to build upon our baseline year of 2010 including broadening our scope of sites included in our inventory. In addition, we will evaluate contributions from perfluorocarbons (PFCs) to determine a long-term strategy to mitigate and reduce GHG emissions.



### **Reduce Energy Usage by 5% from 2010 to 2014**

Detailed tracking and monitoring of utility data will optimize our ability to see where improvements can be made within our organization. Improved metering and lighting controls as well as infrastructure changes will help to decrease electrical consumption. Changes in natural gas related heating and infrastructure will decrease our costs and reliance on this fuel.



### **Reduce Hazardous Waste by 5% from 2010 to 2014**

Due to the amount of hazardous waste we generate, we are currently required to draft biennial reports to comply with regulations. For this reason and the overall nature of these wastes, we have implemented a number of initiatives to decrease and find alternatives within our operations.



### **Achieve and Maintain Solid Waste Diversion Rate of 85% by 2014**

We are currently implementing a number of waste management and reduction initiatives such as waste audits in our facilities and automatic paper towel dispensers in restrooms. Of course, the less we use, the less we have to recycle so these conservation activities will not only save operating costs, but reduce our raw material inputs.



### **Recycling**

In parallel with our operational waste reduction activities, Lam is concentrating efforts on increasing landfill diversion rates, further defining recycling capabilities and ensuring employees are aware of recycling efforts at facilities. In 2010 and 2011, Lam has seen increased cost savings due to renewed emphasis on our recycling program.



### **Evaluate Water Conservation Opportunities**

We design our products to save customers water and money. We take the same approach with our facilities. During 2011, we continued to implement water-saving tactics like automated faucets, up-graded irrigation systems across our facilities, and we are considering multiple options for water re-use and optimizing scrubber and cooling tower blowdown.



### **Health and Safety**

The health and safety of our employees is critical to the success of our facility operations and overall sustainable performance of our business. Throughout our global operations we will strive to leverage our growing health and safety management systems to drive safety incident rates to zero. EHS objectives and metrics are driven throughout our business lines.

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