

## **Cray Green Practices**

When Cray computers impact the planet, it should be in their capacity to solve the world's most intricate scientific challenges. To that end, Cray Inc. strives to conduct business in an environmentally responsible way. In addition to compliance with environmental regulations and enactment of a policy of "reduce, reuse, recycle" in the product development and manufacturing process, Cray works toward active promotion of "green" employee and supplier practices and clear communication of the company's environmental policies.

### **Operations: Environmental Management**

#### **Cray Environmental Policy Statement:**

Cray believes that businesses are responsible for achieving good environmental practices and operating in a sustainable manner.

We are therefore committed to reducing our environmental impact and continually improving our environmental performance as an integral and fundamental part of our business strategy and operating methods.

Protecting our shared environment is of fundamental importance to Cray, as it is to our employees, customers and other stakeholders. To support this common goal, our policy is to:

- Comply with applicable local, state and federal environmental regulations
- Wholly support and comply with or exceed the requirements of current environmental legislation and codes of practice
- Minimize waste and reuse or recycle as much of it as possible
- Continually improve the environmental performance of our products and processes by making products safe for their intended uses, energy efficient, environmentally-friendly and able to be reused, recycled or disposed of easily and safely
- Protect the health and safety of our employees and surrounding communities and ecosystems
- Ensure that all employees understand our environmental policy and are trained to comply with its high standards
- Minimize energy and water usage in our buildings, vehicles and processes in order to conserve supplies, minimize our consumption of natural resources and eliminate practices that would adversely impact the environment
- Use natural resources, including raw materials, energy and water as efficiently as possible.
- Apply the principles of continuous improvement and self-audits in order to improve Cray's environmental management system and performance, and report our progress
- When possible, purchase products and services that do the least damage to the environment and encourage others to do the same
- Address complaints or concerns about any breach of our environmental policy promptly and to the satisfaction of all concerned
- Update our environmental policy annually in consultation with staff, associates and customers

We will make every effort to ensure that environmental performance is an integral part of Cray's performance and of the performance of all our employees. To this end, we will measure and periodically report on our progress in realizing these commitments.

### **Manufacturing Practices:**

#### Production

- Our production areas focus on eliminating or minimizing waste during the manufacturing processes. Materials are recycled whenever possible. No harsh chemicals are typically used, but if they must be, there are procedures for proper handling and disposal. Oxygen sensors and fume extractors are employed. Safety operating procedures are documented and published. All consumer products are recycled; cardboard is baled and metals and paper are recycled. Most electronic products are reclaimed and chemicals are reclaimed by a contractor. A minimal amount of waste is sent to landfills.

#### Logistics

- As customers return Cray products from production, Cray proactively negotiates to obtain the title to each product in exchange for de-installation. Cray then either remarkets the product or sends it to a de-manufacturer for asset recovery and salvage. Cray products are shipped in reusable crates and pallets. Upon completion of installation, arrangements are made to ship the packaging back to Cray for reuse on future product shipments. Cray's advance exchange parts program encourages the reuse of packaging by sending Cray customers the correct packaging with replacement parts in advance of requiring return of defective parts. Cray schedules trips in a manner that minimizes extra travel. Higher-use items are kept close to the usage area to reduce trucking needs, and lower-use items are kept in a warehouse from which they are obtained periodically. We also contract outside services for longer hauls outside of Chippewa Falls.

#### Manufacturing Engineering

- Manufacturing and quality assurance engineers will continue to work closely with our existing and future suppliers to refine and implement environmentally sound packaging materials that maximize recycling and reuse and minimize packaging material volume, handling, waste and related costs.

#### Facilities Management

- No processing water waste is generated and all domestic water is from city utility, incorporating a closed loop system for cooling. DOWTHERM for heat exchangers is reclaimed or reused. Heat exchangers are used through cooling towers to eliminate chillers in specific conditions to reduce power. Free cooling is incorporated as we continue to add capability, upgrade facilities and utilize magnetic bearings to reduce friction. Cray participates in a "focus on energy" initiative with our local power company and we have received ~\$500K in state-funded grants. There are no requirements for scrubbers because we do not emit toxic air. Cray incorporates make-up air units to keep buildings under positive air flow and reduce cold air and heating requirements. Some compressed air is used in the manufacturing process. Nitrogen for environmental testing

boils off or is used up and O2 sensors are employed. IPA and flux are reclaimed and provided to H&S for proper disposal. Only small amounts of cleaning agents are used.

**Environmental Health and Safety (EHS)**

- Our operational policies are rooted in concern for the health and safety of Cray employees and for the preservation and betterment of the environment, which we deem as important as quality, productivity, employee relations and cost. The benefits of safe operating procedures and practices are not limited to expense reduction. Above all, we value the well-being of our employees.
- The success of Cray's safety program depends on a thorough understanding and acceptance of the following precepts:
  - All injuries are preventable
  - Management shares responsibility for the prevention of injuries
  - All hazards can be mitigated
  - Employee training is essential
  - Safety is good business
  - Attention to safety is a condition of employment
- Our EHS aspects are managed by the following six major categories:
  - Health-Related
  - Safety Administration
  - Ergonomics
  - Personal Safety and Protective Equipment
  - Equipment Process and Safety
  - Hazardous Substances and Materials

**Environmental Aspects and Impacts:**

<b>Aspect:</b>	<b>Impact Assessments:</b>
Materials/Chemicals	Reduce natural resource consumption & properly dispose of chemicals
Energy	Utilize power usage incentives, provider partnerships and free cooling
Water	No waste water discharge; closed loop system
Waste	Very minimal and disposed of properly or recycled
Fuel	Minimal due to proximity of facilities and scheduling
Scrap/Obsolete	Take back, recycle and reuse
EHS	Follow all OSHA, other and internal standards as applicable

**Supply Management:**

Purchase order terms and conditions:

- All purchase orders incorporate a full list of terms and conditions that require acknowledgement by suppliers of all defined materials and environmental requirements.

MSDS for all potentially hazardous materials:

- EHS and supply management require MSDS documents for all potentially hazardous materials that may be used in Cray's manufacturing processes or in Cray products.

## **Cray Product Materials Compliance**

### **Recycling/E-Waste WEEE:**

- Cray is aware of the growing concern to minimize the amount of e-waste around the globe and the increasing number of countries that have or are considering legislation to mitigate these risks. With that in mind, Cray always has and continues to encourage the practice to reduce, reuse and recycle.
- EU legislation restricting the use of hazardous substances in electrical and electric equipment (Directive 2002/95/EC) and promoting the collection and recycling of such equipment has been in force since February 2003. In December 2008, the European Commission proposed to revise the directive in order to tackle the quickly-increasing waste stream. The new WEEE Directive 2012/19/EU entered into force on 13 August 2012 and became effective on 14 February 2014.
- The legislation provides for the creation of collection schemes in which customers return their used e-waste free of charge. The objective of these schemes is to increase the recycling and/or reuse of such products.
  - In compliance with the European Union's Waste Electrical and Electronic Equipment (WEEE) directive that requires the proper handling and disposal of end-of-life equipment, Cray proactively works to properly label products, register worldwide as a manufacturer, and provide information to customers about environmentally sound disposal practices. Cray customers are encouraged to participate in the company's take-back program for the collection and treatment of components ready for recycling.

### **Reporting, Registration and Recycling:**

- Cray cooperates with an expert partner in the EU to register and report on a monthly basis to all EU participating countries to which we provide products.
- We also utilize our EU partner to coordinate and carry out the recycling and proper disposal of all retired products that are not already sent back to Cray as part of Cray's take-back program.

### **Take-Back Program:**

- Cray's products are compliant with the European Union's Restrictions on the Use of Hazardous Substances (RoHS) directive and similar worldwide legislation. Working with customers, suppliers and environmental experts, Cray proactively implements systems to ensure future compliance and to prepare for upcoming environmental directives. The

company's [product recycling program](#) allows customers to dispose of end-of-life equipment with minimal impact.

#### **Batteries:**

- Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC, commonly known as the Battery Directive, regulates the manufacture and disposal of batteries in the European Union with the aim of improving the environmental performance of batteries and accumulators. Batteries commonly contain hazardous elements such as mercury, cadmium and lead, which, when incinerated or landfilled, present a risk to the environment and human health.

#### Reporting, Registration and Recycling for Batteries:

- Cray cooperates with an expert partner in the EU to register and report to all EU participating countries that we provide product to on a monthly basis.
- We also utilize them to coordinate and carry out the recycling and proper disposal of all retired products that are not already sent back to Cray as part of Cray's "take back program".

#### **EU RoHS:**

- Cray Inc. is fully committed to complying with the European Union's Restrictions on the Use of Hazardous Substances Directive 2011/65/EU (RoHS2) and with all other applicable substance restriction legislation worldwide.
- RoHS restricts the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBBs), polybrominated diphenyl ethers (PBDEs) and decabromodiphenyl ether (DecaBDE).
- RoHS took effect on 1 July 2006. All new Cray products and upgrades shipped after 1 October 2006 are RoHS-compliant.
- Moving forward, Cray Inc. is proactively implementing systems and practices to assure continued conformance to the EU's RoHS Directive and to similar legislation in geographies including China, Korea and others.

To cite several examples of its overall product design activities, Cray:

- Surveys its customers
- Works with its supply chain partners to address existing and future product design requirements from both governments and customers
- Solicits expert guidance to assure proper interpretation and implementation in regard to all applicable directives

#### Specification:

- Cray employs a company-wide environmental compliance specification that is tied to all part numbers and provided to all active and potential suppliers.

#### PO Terms and Conditions:

- All purchase orders contain environmental requirements pertaining to RoHS, REACH and other regulations that all suppliers must agree with and adhere to.

#### Minimize and Eliminate Exemptions:

- While Cray has relied on exemptions for “lead in solder for servers” in the past, we are now actively designing our systems and producing lead-free products, with the goal of becoming fully exemption-free.

#### CE Mark and DOCs

- With the dawn of RoHS2 and its inclusion of CE marking requirements, we demonstrate that all our products are designed to be CE-compliant, and therefore RoHS-compliant, regardless of their final customer destinations.
- Cray has authored DOCs (Declarations of Conformity) for each of our major product lines and they are available upon request.

### **EU REACH:**

#### Statement and Explanation of Article 33 Commitment

- The European Registration, Evaluation and Authorisation of Chemicals (REACH) Regulation entered into force on 1 June 2007. This regulation is the most complex piece of legislation to ever emerge from the European Community and it affects every business in the supply chain.
- The aim of REACH is to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances. At the same time, innovative capability and competitiveness of the EU chemicals industry should be enhanced. The benefits of the REACH system will come gradually, as more and more substances are phased into REACH.
- REACH replaces about 40 pieces of legislation with a streamlined and improved regulation. Other legislation regulating chemicals (e.g. cosmetics and detergents) or related areas (e.g. chemical handling, product safety and construction products) not replaced by REACH will continue to apply. REACH has been designed not to overlap or conflict with other chemical legislation.
- After reviewing the obligations and responsibilities that affect businesses operating in Europe, which includes simply selling products within the territory, Cray Inc. has determined that we are suppliers of articles to consumers, and that we will be bound to comply with relevant pieces of the legislation based on this determination (Art. 33).
- Cray Inc. is an article supplier, as our products do not satisfy the criteria of being classified as chemicals or preparations. The definition of an "article" under REACH is:
  - *"an object during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition"*
- Because Cray Inc.'s products do not intentionally release chemicals or preparations, Cray Inc. is not bound by Art. 7(1) of the REACH regulation which requires registration of chemical substances. However, Cray Inc. is bound to comply with Art. 33 requirements for the provision of information concerning Substances of Very High Concern (SVHC) to its customers and

consumers as well as Annex XVII regarding the restriction of substances. Additionally, if Cray Inc. determines that the SVHC presence within our products being imported is in a quantity greater than one tonne, then Cray Inc. may have notification requirements to the European Chemicals Agency as required by Art. 7(2).

**The Green Grid:**

- Cray is a member of The Green Grid, a global consortium dedicated to advancing energy efficiency in datacenters and business computing ecosystems. The Green Grid is focused on defining meaningful, user-centric models and metrics; developing standards, measurement methods, processes and new technologies to improve datacenter performance against the defined metrics; and promoting the adoption of energy-efficiency standards and energy-efficient processes, measurements and technologies.
- Comprised of an interactive body of members who share and improve best practices for datacenter efficiency, The Green Grid's scope includes collaboration with end users and government organizations worldwide to ensure that each organizational goal is aligned with both developers and users of datacenter technology.