



Electronic Product Environmental Labels

Introduction

There is growing interest among consumers, governments, and businesses in the environmental aspects of products. Issues such as product energy efficiency, product takeback and recycling, and use of hazardous materials are increasingly a part of the buying decision. This is particularly true in the more environmentally aware markets of northern and central Europe and Japan. This recognition for products with environmentally preferable attributes has prompted green procurement activities in markets around the world and created the need for systematic and standardized communications with respect to environmental claims for products.

This paper discusses the various environmental label types and programs affecting electronic products and details EIA's position on the appropriate use of these labels.

Environmental Label (Eco-Label) Types

Recognizing the importance of environmental communications and the corresponding potential for inaccurate and misleading environmental claims, the International Standards Organization (ISO) has undertaken efforts to provide standards and guidance for environmental claims. ISO classifies environmental labels into three categories:

- Type I labeling programs are based on environmental criteria selected by an independent third party entity. Criteria are typically developed for a specific product type such as personal computers or monitors. Products must be certified to these criteria through the third party entity. Products that are certified to the criteria are allowed to display the third party entity's environmental seal, indicating that the product has been determined to be environmentally preferable. Examples of Type I programs with established criteria for electronic products include Germany's Blue Angel, the European Union's Eco-Flower, the Swedish TCO label, and the Japanese Eco-Mark.
- Type II labeling programs are based on self-declarations by manufacturers. These declarations can be made on a single attribute such as energy efficiency or use of recycled content materials, or they may take the form of a comprehensive declaration of many environmental attributes. Both the European Computer Manufacturers Association (ECMA) and the Nordic Information Technology Organization (NITO) have developed standardized

formats for manufacturer self-declaration of environmental attributes for electronic products. Additionally, the Japan Electronics Information Technology Association (JEITA) has developed an eco-label for Personal Computers, which allows manufacturer self-declaration.

- Type III labeling programs are based on development and communication of quantitative life cycle environmental inventory and impact assessments for products, and like Type I labels, require third party certification. Due to the extreme difficulty in obtaining life cycle data on complicated products such as computers and other electronic products, Type III labels have seen little acceptance within the IT industry. However recent pilots of Type III labels in Japan, and increased research into LCA methodologies in Europe may indicate increased interest in these types of labels.

Type I Labeling Programs

There are more than a dozen Type I environmental labeling programs with established criteria for electronic products. Currently, these labels are limited to low-end products like personal computers, notebook computers, personal printers, and monitors. Table 1 shows some of the most popular Type I programs, the IT products covered by these programs, and the range of criteria covered.

Of these Type I programs, only the TCO eco-label has gained significant market acceptance. TCO, a Swedish white-collar trade union, published its first environmental label for monitors in 1992. At that time, labeling criteria were limited to electromagnetic emissions. Many manufacturers certified to the original TCO criteria. With strong manufacturer support, the label eventually gained added importance in the marketplace. Today, TCO compliance is considered by many to be a de facto requirement for sale of monitors in Europe.

In 1995, TCO revised its criteria for monitors to include other environmental criteria, as well as product safety and ergonomics criteria. Additionally, they added new product categories for products like printers and personal computers. Criteria were revised again in 1999, incorporating more stringent environmental requirements, and TCO is once again working on another revision due in 2003. While most manufacturers continue to certify monitors to the TCO criteria, few manufacturers have been willing to expend the necessary resources to certify other product types.

While not regarded as important as TCO compliance for monitors, the Blue Angel eco-label has gained some acceptance with customers, particularly those involved with government procurement, in Germany.

The European Union has also developed a Type I environmental label for personal computers and notebook computers known as the Eco-Flower. The original Eco-Flower criteria for computers were released in 1999. Criteria for personal and portable computers were revised in June 2001. There has been no significant movement by manufacturers to certify to the Eco-

flower criteria. In February of 2001, the EU Commission released the long-awaited green paper on its “Integrated Product Policy (IPP).” One recommendation of the IPP green paper was the consideration of reduced value added tax for products certified to the EU Eco-Flower.

Outside of Europe, the only Type I environmental label of significance is the Japanese Eco-Mark. The Japanese Eco-Mark was developed by the Japan Environment Association (JEA) and is modeled closely after the German Blue Angel Program. Eco-Mark criteria have been released for desktop and notebook computers as well as monitors. Eco-Mark compliance was given a boost by the Japanese government as compliance with the criteria is assumed to be an indication of environmental preferability under the Japanese Green Procurement Law.

Environmental Labeling and Certification Declaration Programs

Environmental Labeling and Certification Declaration Programs								
	Type I Eco-Labels					Environmental Declaration Formats		
	Blue Angel (Germany)	White Swan (Nordics)	TCO '95 (Sweden)	TCO '99 (Sweden)	Eco Mark (Japan)	ECMA TR/70	NITO (Nordics)	PC Green Label (Japan)
Products Covered								
Personal Computer Workstations	X	X	X	X	X	X	X	X
Notebook Computers	X	X	X	X	X	X	X	X
Monitors	X	X	X	X	X	X	X	X
Printers	X	X		X	X	X	X	
Keyboard/Mouse	X			X	X	X		X
Issues Covered								
Hazardous Substances	X	X	X	X	X	X	X	X
Use of Hazardous Materials - Plastics	X	X	X	X	X	X	X	X
Use of Hazardous Materials - Product Packaging	X	X	X	X	X	X	X	X
Use of Hazardous Materials - Monitors/CRTs	X	X	X	X	X	X	X	X
Batteries - Hazardous Materials Content	X	X	X	X	X	X	X	X
Batteries - Easy Removal	X				X		X	X
Batteries - Labeling	X				X	X	X	X
Product Chemical Emissions	X					X		
Finishes	X	X			X		X	X
Energy Efficiency	X	X	X	X	X	X	X	X
Acoustics	X	X	X	X	X	X	X	X
Electromagnetic Compatibility (EMC)	X	X	X	X	X	X	X	X
Electromagnetic Fields	X			X		X		
Modularity/Upgradeability	X	X			X	X	X	X
Design for Assembly/Disassembly	X	X			X	X	X	X
Use of Fewer Materials	X	X	X	X	X		X	X

Environmental Labeling and Certification Declaration Programs								
Labels	X	X			X			X
Marking/Coding of Plastic Parts	X	X	X	X	X	X	X	X
Use of Recycled Materials	X				X			X
Product "Takeback"	X	X		X	X	X	X	X
Ergonomics	X	X	X	X			X	
Product Safety	X	X	X	X	X		X	X
Product Warranty	X				X			X
Environmental Certification (ISO 14001 or EMAS)				X		X	X	

Type II Labeling Programs

In response to pressure to comply with a myriad of eco-label requirements and increased customer demand for more environmental information, many manufacturers have moved to self-declaration of environmental information. Self-declared environmental claims can take many forms, ranging from a simple claim on a single attribute such as recycled content or energy efficiency, to completion of more comprehensive declarations with multiple environmental attributes.

Perhaps the most recognized Type II label is the Energy Star label. The Energy Star label was initiated in the U.S. under the Federal Environmental Protection Agency. However, a recent agreement between the U.S. government and the European Union on development and use of the Energy Star label opens the way for further international acceptance of the logo. While the U. S. EPA along with the EU now establish Energy Star criteria, manufacturers are allowed to self-certify compliance.

Two widely recognized Type II labeling initiatives exist in Europe. In the Nordic countries, the Nordic Information Technology Organization (NITO) established a comprehensive environmental declaration in response to numerous industry requests for Type I eco-labels such as TCO, Blue Angel, or the Nordic White Swan. The NITO environmental declaration has gained widespread acceptance in the Nordic countries as a viable alternative to Type I labels on many product types. Additionally, the International IT association, ECMA, has established an environmental declaration format. Developed by ECMA's Technical Committee 38, the ECMA environmental declaration format is somewhat simpler than the NITO format that includes a number of non-environmental attributes such as ergonomics and product safety.

Individual manufacturer Type II environmental claims have become commonplace in Japan, as manufacturers try to promote the environmental attributes of their products. However, until recently there have been no standard declaration formats. The Japan Electronics and Information Technology Association (JEITA) has released guidelines and criteria for a version of a Type II label for personal computer products known as the PC Green Label. The PC Green Label has some elements of a Type I label in that it has multiple defined criteria required to qualify for the

label. However, since manufacturers are allowed to self-certify to the requirements, it might also be called a Type II label.

Type III Labeling Programs

Type III eco-labels have their foundation in Life Cycle Assessment methodologies. They can give a very accurate representation of a product's environmental attributes when product origins (locations for all life cycle processes) are specifically identified and inventoried. However, they can also be very inaccurate and misleading when used to represent generalized production and end-of-life processes for the global marketplace. Type III labels attempt to provide specific and quantified environmental impact information on products such as their non-renewable resource consumption and global warming potential. Unlike Type I labels, where a third party evaluates environmental information and decides whether a product should be considered environmentally preferable, a Type III label makes no claim of environmental superiority. This decision is left up to the consumer and user of the label information to compare results for all reported environmental impact categories. Because of this fact, Type III labeling programs typically must focus resources on education of label users. Many environmental professionals believe that Type III labels are most beneficial for business to business or business to government purchases where those purchasing products are typically better educated on environmental criteria.

Type III labels are also the most complex and costly to generate with reasonable data quality. Manufacturers typically track resource allocation at the facilities level, not at a product level, thus leading to difficulty in generation of life cycle inventory data. Additionally, critical information on purchased components is often unavailable due to supplier concerns with confidentiality. Generation of environmental life cycle information from primary data sources for a single product, such as a personal computer, could take several years to complete and cost hundreds of thousands of dollars. For example, the U.S. EPA completed a life cycle assessment comparing the environmental attributes of flat panel displays and cathode ray tube (CRT) monitors. The study involving direct supplier participation took more than three years to complete at a cost of more than \$500,000. The development of life cycle inventory data for the CRTs and Flat Panel Displays alone required more than a year to complete.

Because of this fact, many Type III labels resort to the use of generic industry data for many components or the use of simplified life cycle approaches. While these approaches can reduce data requirements, they also significantly reduce the accuracy and usefulness of the final label. For example, many reported Life Cycle Assessments for electronic products use generic industry data for basic commodity materials to represent the life cycle impacts of printed wiring boards and their components. The considerable environmental impacts of electronic device manufacturing are not included because of the complexity of the materials and operations required for inventory. Generic materials data fails to differentiate between the hundreds or thousands of component types or printed circuits board materials in use in the electronics industry or the geographic dependencies of their impacts.

The result of Type III disclosures of this nature is the comparison of relatively minor differences in basic construction materials between various products, while significant environmental impacts associated with electronic component manufacture and assembly are ignored. Moreover, the more complex the product system of interest, the more approximations of materials and manufacturing processes must be summed, leaving any final total with an inherently large- and frequently unspecified- range of error. In some cases, the limitations of Type III labels resulting from these simplifications may not be transparent to label users, giving them more confidence in the label result than is truly warranted.

Industry has little experience with the development of Type III labels for complicated electronic products. The Japan Environmental Management Association for Industry (JEMAI) has conducted a pilot of a type III eco-label for personal computers. Additionally, emerging efforts in Europe to look at promotion and standardization of Life Cycle Assessment practices may lead to promotion of Type III labels in the future.

Analysis / EIA Position

While Type I eco-labels continue to gain acceptance among customers as a simple way to ascertain the environmental preferability of products, they present a difficult situation for manufacturers. The time and costs associated with obtaining a Type I eco-label are generally high. At the same time, the low-end electronic products to which these eco-labels apply are marketed for only a short time. Thus many products are replaced in the time that it would take to obtain an eco-label.

Another problem with Type I eco-labels is their differing and constantly changing criteria. No two Type I eco-label programs have the same product criteria, and no single Type I program is accepted worldwide, or even within a majority of geographic areas. While 80% of the programs' criteria may be identical, many Type I labeling programs attempt to differentiate their label by adding unique criteria. In many cases, these criteria are based on poor science and disregard tradeoffs with other key product characteristics such as safety, cost, reliability, and product function. Consequently, obtaining the labels often requires manufacturers to modify the design of their products to meet all criteria. Type I eco-labels, therefore, do not represent the most effective or meaningful environmental labeling programs for electronic products.

While Type III labels may offer promise of quantitative environmental impact profiles on products, the cost and time required for generation of appropriate data quality for these labels for electronic products makes them impractical. Consequently, EIA opposes efforts to develop Type III labels for electronic products.

The most logical alternative to the proliferation of Type I labels continues to be a credible Type II environmental declaration. However, from a resource standpoint, the generation of

environmental declarations in multiple formats is not in manufacturers' interests. Given the strong acceptance of the ECMA TR70 declarations throughout most of Europe, EIA supports the continued development of this label format for electronic products.

Summary

The proliferation of multiple eco-label types and formats represents a significant challenge for electronics manufacturers. Differing criteria and requirements for Type I programs, along with the significant cost and time required to obtain these labels, significantly impact manufacturers' abilities to use these programs.

Type III eco-labels are extremely data intensive and require too much time and cost to develop. EIA opposes efforts to develop Type III labeling programs for electronic Products.

Type II environmental declarations represent the best alternative for manufacturers to routinely communicate environmental information about products. Environmental declarations based on ECMA TR 70 recommendations are the preferred format for these declarations.