Association Connecting Electronics Industries

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RE: Öko-Institut Inventory of Potentially Hazardous Substances in Electrical and Electronic Equipment, "Study on Hazardous Substances in Electrical and Electronic Equipment (EEE), not Regulated by the RoHS Directive"

IPC - Association Connecting Electronics Industries submits the following comments to the Öko-Institut regarding its inventory of potentially hazardous substances used in Electrical and Electronic Equipment (EEE) as part of its "Study on Hazardous Substances in Electrical and Electronic Equipment (EEE), not Regulated by the RoHS Directive." IPC is significantly concerned that the Öko-Institut has arbitrarily and capriciously developed a list of substances with little or no scientific basis. The electronics industry has invested an enormous amount of time and resources to comply with existing RoHS substance restrictions and the full technical, social, and cost implications of the RoHS Directive's implementation are still being discovered. IPC urges the Öko-Institut to avoid restricting additional substances to the RoHS scope while industry, governments and the public are still facing a variety of implementation challenges. Any expansion of the RoHS scope must be thoroughly reviewed for technical feasibility. Should the Öko-Institut deem additional substance bans to be absolutely necessary, a full life cycle assessment of the substance and its substitutes must be conducted in order to ensure that the substitution does not have unintended adverse environmental and human health impacts. IPC believes that any further substance restrictions beyond RoHS would more appropriately be addressed under the current REACH (Registration, Evaluation and Authorization of Chemicals) Directive to avoid unnecessary confusion and regulatory overlaps.

IPC is a global trade association with over 275 member companies located in the European Union. IPC represents all facets of the electronics interconnect industry, including design, printed circuit board manufacturing and electronics assembly. Printed circuit boards and electronic assemblies are vital components of all electronic devices including computers, cell phones, pacemakers, and sophisticated missile defense systems.

IPC is extremely concerned that the Öko-Institut has arbitrarily and capriciously placed substances on their inventory of potentially hazardous substances used in EEE. The European Commission specified the criteria to be used by the Öko-Institut to identify high priority substances. These criteria are: CMR, PBT, vPvB and endocrine disruptors. The recently finalized EU Risk Assessment for the BFR (brominated flame retardant) TBBPA (Tetrabromobisphenol-A) confirms that TBBPA does not meet any of the above criteria yet the Öko-Institut has inexplicably included TBBPA on the list of potentially hazardous substances in EEE. The Öko-Institut has also misused and misinterpreted the Joint Industry Guide (JIG) by including the BFRs on the JIG list in their list of potentially hazardous substances in EEE. The JIG was never intended to be used as a basis for any substance restriction. Rather, the JIG was developed (and is currently being updated) for declaration purposes only (and not legislative purposes) in order to share information along the supply chain. IPC urges the Öko-Institut to have a valid and scientific basis for including any additional substances to the RoHS Directive.

Through leadership and innovation, the electronics industry has continuously striven to improve manufacturing processes and products so that materials of concern are minimized or eliminated where feasible. Our industry has collectively spent billions of dollars worldwide on RoHS compliance to redesign products and components; conduct comprehensive reliability testing on redesigned products using replacement materials; implement materials declaration and due diligence processes; and overhaul inventory management and component tracking systems throughout a global supply chain that includes hundreds of thousands of companies.

IPC urges the Öko-Institut to fully evaluate the life cycle (design, use and end of life) impacts of the proposed substitutes before restricting substances currently in use. There should be clear and compelling evidence that potential substitutes are available, are reliable over the long-term and are preferable from a life cycle perspective. Until life cycle assessments are conducted proving that the environmental and human health impacts across the alternative's life cycle are better than the substances being replaced, the Öko-Institut should not restrict any further substances under RoHS.

It is important to note that materials selection is an extremely complex issue. Electronics manufacturers use certain materials of concern because of their unique energy efficiency, safety or performance characteristics when no viable or environmentally-preferable substitutes exist. With electronics, drop-in substitutes are rarely feasible. The substitution of one substance for another can create a cascade of performance and functionality issues. The search for alternatives is complicated by limited alternatives, higher costs and possible risks posed by those alternatives. For example, the shift from lead bearing solder alloys to lead-free alloys has created reliability concerns within solder joints. Because the lead within the alloys provides greater ductility within solder joints, the ductility of tin-lead solder joints is greater than the ductility of high tin content lead-free

solder joints. Although the high tin content solder joint may be stronger, the thermal stresses applied are transferred to other locations within the assembly causing failures within the board or the components. This is just one example of the many technical issues which continue to challenge the electronics industry during its implementation of the RoHS Directive.

Review of the U.S. Environmental Protection Agency (EPA) Lead-Free Solder project[1] illuminates the environmental trade-offs inherent in material substitutions. The study evaluated the environmental impacts of tin-lead solder versus lead-free alternative solders. Because tin-silver-copper solder in electronics requires higher processing temperatures than tin-lead solder tens of thousands of solder machines worldwide now operate at higher temperature. The higher operating temperatures required for the manufacture of lead-free electronics has resulted in significantly higher energy usage during manufacturing. The increased energy use associated with manufacturing lead-free electronics was projected by the study to cause higher air pollution, acid rain, stream eutrophication, and global warming impacts than the tin-lead soldered electronics. The environmental impact of the lead-free alternatives is an important factor that was not considered during the European Union's decision to restrict the use of lead in electronics based solely on its potential toxicity. EPA's study serves as an important reminder that there are environmental trade-offs when substituting one substance with another. A complete application of the precautionary approach would be to examine the potential impacts of likely substitutes prior to instituting a ban of a critical substance. IPC urges the Öko-Institut to be mindful of the importance of fully considering all life cycle impacts before materials are banned or eliminated from use.

IPC is also concerned that the addition of new substance restrictions to the RoHS Directive would interfere with the current EU approach on chemicals regulation under the Registration, Evaluation and Authorization of Chemicals (REACH) Directive. While REACH will also have a significant impact on the electronics industry, it would be more sensible to address any further substance bans under REACH in order to prevent overlapping and duplicative chemical regulations. By expanding RoHS to include new substance restrictions, the Öko-Institut would undermine REACH's intent to streamline the European Union's chemical regulations. IPC remains hopeful that the REACH process will include a more thorough life cycle evaluation of the substances and its alternatives, resulting in an efficient and effective chemical regulatory system.

IPC understands and supports the need for cost effective, science-based regulations that are protective of the public welfare and environment. IPC urges the Öko-Institut to revise its list of potentially hazardous substances in EEE to ensure that it is scientifically

[1] U.S. Environmental Protection Agency. August 2007. *Solders in Electronics: A Life-Cycle Assessment.* Available at http://epa.gov/dfe/pubs/solder/lca/index.htm.

based and meets the specific criteria established by the European Commission. In its RoHS Review, the Öko-Institut must ensure that any new substance restrictions are based on comprehensive life cycle analyses. If additional substance restrictions are necessary, they should be handled under the REACH process where chemical risks will be fully evaluated. Any expansion of the RoHS scope must conform to the highest technical review standards and should not contribute to further reliability concerns. IPC looks forward to working with the Öko-Institut during its RoHS Review. Should you have any questions, please contact Fern Abrams at 703-522-0225 or fabrams@ipc.org.

Sincerely,

Fern Abrams
Director, Government Relations & Environmental Policy