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**March 28, 2024**

**Comments to UN Special Rapporteur on Toxics and Human Rights**

**Response to Call for Input on Gender and Toxics**

**21st Century context and factual background:**

**The challenges of a rapidly changing chemically dependent industry**

Moore’s law has always been a double-edged sword. In 1965, Intel co-founder Gordon Moore predicted a doubling of transistors on each new generation of semiconductor chip, making each new generation twice as fast and twice as small. This… has been a guiding principle for the semiconductor industry for close to 60 years.”[[1]](#footnote-1)

At the same time, the dizzying pace of change has been the source of many problems now associated with the rise of the high-technology industry:

In 1992, Dr. Myron Harrison, a physician for IBM, recognized that semiconductor “[e]ngineers are not evaluated nor rewarded on their ability to ... understand new or unusual health hazards. This task is the responsibility of health and safety professionals. *Unfortunately, the opportunities for the professionals to be involved before these new processes arrive at the manufacturing floor are being diminished by the quickening pace of technologic change*…” [[2]](#footnote-2)

Today, the electronics industry leaders must acknowledge that they neglected to protect their workers from exposures to the 1000s of toxic chemicals used, compensate the employees made sick, and invest far more in preventing future harm than was spent in the past, up and down the supply chain.”[[3]](#footnote-3)

**Problem Statement**

**T**here is a long history of identifying, documenting and addressing the toxic impacts to women's’ and children’s health in electronics workers in Silicon Valley and around the world - especially important since the global electronics production workforce consists primarily of women of child bearing age. An estimated 18 million workers produce and create a $1.7 trillion trade in electronics products, according to IndustriALL and Electronics Watch.

A recent report from The International Labor Organization the EU and OECD states:

“The global electronics industry employed 17,430,942 workers in 2021. Women workers make up the bulk of the labour force in the global electronics supply chains. In the ASEAN region, the industry generates more than 2.4 million jobs annually.”[[4]](#footnote-4)

Electronics factories use 1000s of chemicals[[5]](#footnote-5),[[6]](#footnote-6);[[7]](#footnote-7) many are reproductive and neurodevelopmental toxins, and many more are untested for any toxicity. [[8]](#footnote-8)

There have been many serious health impacts to both workers and their offspring.[[9]](#footnote-9),[[10]](#footnote-10)

The American Public Health Association endorsed a comprehensive resolution in 2012 addressing the health impacts of the global electronics industry:

“A variety of adverse health outcomes are associated with chemicals used in the electronics sector … including cancer, lung disease, reproductive disorders, congenital anomalies in offspring —have been identified in manufacturing facilities located in China, Korea, Malaysia, and elsewhere. Female workers in the semiconductor and electronics industry may also be at increased risk for spontaneous abortion and subfertility.  Some evidence … suggests that environmental exposure to chemicals while working in the electronics industry may lead to intergenerational adverse health outcomes.” [[11]](#footnote-11)

S**ome of the most important global proposals to address these critical health issues should be turned into recommendations to address gender and toxics by the Special rapporteur.**

1. **SAICM on electronics - 2011**

In March, 2011 more than 100 representatives of governments, NGOs and the electronics industry met in Vienna, Austria …. to advance the Sound Management of Chemicals within the electrical and electronic products industry.

Three of the essential messages adopted unanimously were:

* Preventing harm to human health and the environment from hazardous substances in the life-cycle of electrical and electronic products is essential.
* The life-cycle approach in the sound management of chemicals found in electrical and electronic products is of key importance.
* The expected growth in the electrical and electronic sector (due to Moore’s Law) and *the need for its long term sustainability will require making parallel and proportional improvements in environmental, health and safety, and social justice attributes.[[12]](#footnote-12)*

2. **The NGO Chemical Challenge to the electronics industry**

In January 2025, The International Campaign for Responsible Technology (ICRT), the GoodElectronics Network convened a global conference. They issued a public challenge to electronics companies to reduce and eliminate chemical and physical hazards through the development and adoption of safer alternatives. It has been endorsed by hundreds of NGOs, unions, and civil society groups.

***We urge the Special Rapporteur to incorporate these recommendations for adoption by governments and companies around the world.***

Specifically, six key areas for change and action were identified for electronics brands, manufacturers and their suppliers:

1**. Be transparent.** Provide full materials disclosure to workers, communities, and the general public, including what chemicals are being used and what hazards to the environment and humans (including reproductive hazards) are known to be associated with the chemicals.

2. **Use safer chemicals.** Assess hazardous materials used in manufacturing throughout the product lifecycle and replace them with safer alternatives. Where the environmental or human health effects of a substance are unknown, its use shall be avoided; where it is inadequately or incompletely characterized, the precautionary principle shall apply until all relevant hazard testing is available.

3. **Protect Workers**. Develop and implement… comprehensive hazard monitoring for all workplaces and workers.… This includes training, capacity building, and industrial hygiene monitoring as well as monitoring to measure exposures and health surveillance to identify and prevent diseases. Workers must be able to negotiate over hazardous working conditions and refuse hazardous work without fear of retaliation.

4. **Guarantee participation**. Respect efforts of workers and communities to participate in the sound management of chemicals and wastes in their workplaces and communities. This includes the development of effective worker health and safety committees and training programs… Conduct effective, transparent, independent monitoring of all discharge streams.

5. **Compensate and remediate for harm** to people and environment**.**

**6. Develop and fund** mechanisms that ensure that workers or communities harmed by exposure to hazardous chemicals receive emergency relief and just compensation.[[13]](#footnote-13)

**3. Meeting the Challenge**

A follow up report was issued in June 2015, calling on the electronics industry to:

Use safer chemicals

Research and chose safer substitutes

Protect Workers

“*Risks from hazardous substances to the safety and health of workers, who are routinely exposed to “low levels” of multiple chemicals on the job, must be eliminated or reduced to a minimum, including risk to the pregnant worker and her fetus*.”

\* Develop and implement comprehensive workplace hazard monitoring protocols and methods that take into account privacy and are gender- and culture-sensitive.

* Participatory training of all workers and managers potentially exposed;
* Comprehensive ongoing industrial hygiene and environmental monitoring to measure the release of and exposure to all Materials of Concern
* Ongoing independent comprehensive health surveillance …for all workers, to identify and prevent diseases. Results shall be disclosed to workers;
* Recognition of workers’ rights to negotiate regarding hazardous working conditions.

\* Workers have the right to collectively bargain

\* Joint Health and Safety Committees[[14]](#footnote-14)

4. CEPN - <https://cleanelectronicsproduction.org/>

The Clean Electronics Production Network - founded in 2016 - unites diverse stakeholders to understand, address, and eliminate workers’ exposure to toxic chemicals in the electronics supply chain.

CEPN comprises more than 20 member organizations including Apple, Intel, Hewlett Packard, Dell, Seagate as well as NGOs and governments. CEPN has developed a series of tools to help companies reach the goal of zero exposure to workers from toxic chemicals throughout the global electronics supply chain.

***We recommend that the Special Rapporteur urge electronics companies and governments to embrace and adopt these tools to protect workers from gender related toxic exposures.***

Tools include:

1. **a priority chemicals list of hazardous solvents**[[15]](#footnote-15)  
CEPN has identified the 1st and 2nd Round of Priority Chemicals — process chemicals to be prioritized for elimination or substitution in electronics manufacturing.

2. **The Process Chemicals Data Collection (PCDC) Tool**[[16]](#footnote-16) is a free and publicly available standardized reporting tool that improves the task of collecting and managing process chemicals data -

3. **RESOURCES FOR SAFER ALTERNATIVES** [[17]](#footnote-17)

Several organizations currently certify [safer manufacturing cleaning products and accepted substances](https://cleanelectronicsproduction.org/tools-resources/safer-alternatives/certified-products-and-accepted-substances) as well as provide evaluation of formulations to assist the electronics industry in finding and selecting safer alternatives.

4**. JOINT CHEMICAL SAFETY COMMITTEE GUIDANCE**[[18]](#footnote-18)

Structure and Representation of Committee

* Composed of equal numbers of management and worker representatives.
* Worker representatives are democratically elected by workers… without management interference in either case.

EDUCATION & TRAINING FOR COMMITTEE MEMBERS

A key role of the Joint Committee is to determine the training and education needed by both workers and management.

MONITORING EFFECTIVENESS

Indicators for Effectiveness:

o Chemical safety meetings

o Chemical safety education and training delivered

o Chemical hazards identified and risks assessed and controlled

o Inspections and corrective actions taken

o Number, location, and severity of worker injuries and illnesses related to chemical hazard exposure Incidents resulting in lost time or restricted duty

**Chemical Database and Toolboxes**

* The Chemical Hazard and Alternatives Toolbox (ChemHAT) is a user-friendly internet database that provides information that can be used to protect workers and communities against harm that chemicals can cause. ChemHAT allows users to look up chemicals by their chemical name or CAS (Chemical Abstracts Services registration) number and provides users with safer alternatives.[[19]](#footnote-19)

**What are current ongoing efforts to address these critical health issues?**

1. February 26, 2024 letter from Honorable Zoe Lofgren to Secretary of Commerce Gina Raimundo:

“We must do more to ensure the CHIPS investments support the health and wellbeing of the semiconductor and construction workforce and surrounding communities. The CHIPS Program office must take concrete steps through both the incentives and research programs to support quality jobs.

The Department should require the *highest global standards for exposure, occupational protections, and monitoring and removing of toxicants* when making awards under the incentives program. Many communities, including those in Silicon Valley which I represent, have suffered because of chemical exposures related to the semiconductor industry. OSHA standards alone will not be sufficient to protect the health and safety of workers in the microelectronics industry, the construction industry, and in surrounding communities.

Even the leadership of OSHA has publicly stated that OSHA standards are insufficient to protect employees from toxic exposure. As I have relayed to you and to your staff as recently as February 14th, the ***Department of Commerce should require implementation of the highest available standards as set by the Environmental Protection Agency (EPA) or another credible and appropriate organizations.***  {emphasis added}

*The semiconductor research and development (R&D) program should prioritize research focused on improving occupational health and safety in the semiconductor ecosystem, including detection and measurement technologies, remediation strategies, and alternatives to toxicants in the semiconductor manufacturing process*. This research has been lagging for many years and needs to be accelerated. Safer chemical alternatives are still in early development. Some alternatives may be deficient. Other alternatives may simply not exist yet, and it will take years to develop and test them at scale. CHIPS R&D programs must help accelerate these timelines and drive innovation. “ [[20]](#footnote-20)

2. **ICRT Response to Chips Program Office (CPO) on the Draft Programmatic Environmental Assessment on the Chips Act**

“OSHA standards for chemicals were mostly developed in the 1960s and 70s, and have long been acknowledged by OSHA leadership to be out of date and insufficiently protective.

Dr. Michaels, the former Head of U/. S. OSHA explained:

*[“Many of these PELs are dangerously out of date and do not adequately protect workers. Past efforts to update our PELs have largely been unsuccessful. Since 1971, OSHA has successfully established or updated PELs for only about 30 chemicals. We have issued only one new exposure limit since the year 2000. As a result, many workers are currently being exposed to levels of chemicals that are legal, but not safe.”](https://www.ishn.com/articles/103083-oshas-exposure-limits-are-dangerously-out-of-date)*

CPO should improve transparency and accountability among CHIPS Incentive Grant recipients.

For many years the semiconductor industry has followed the mantra, *“what gets measured gets managed”.* The PEA should articulate clear monitoring and reporting requirements to assure that implementation will meet the stated goals of sustainability.  The monitoring data should be publicly available to assure credibility and compliance.

The CPO has both the authority and obligation to ensure that its investments in chip-plant modernization protect human health and the environment. We recommend that all funding agreements should contain enforceable, transparent environmental language, including monitoring to confirm compliance.

1. Monitor exposures and releases

a. Make monitoring regular and public.

   b. Require medical monitoring programs

c.  Ensure public access to hazardous information

d. Ensure workers are safe from workplace hazards[[21]](#footnote-21)

**Conclusion**

The Soesterberg Principles were adopted by the Trans-Atlantic Network for Clean Production on May 16, 1999. It was a commitment that for each new technical [innovation](https://en.wikipedia.org/wiki/Innovation) in the industry, that innovation should also include improvements in the [environment](https://en.wikipedia.org/wiki/Natural_environment), [health](https://en.wikipedia.org/wiki/Health), and [social issues](https://en.wikipedia.org/wiki/Social_issues) that follow. It is an electronic [sustainability](https://en.wikipedia.org/wiki/Sustainability) commitment that technical improvements should correspond to environmental and health improvements. The Electronic Sustainability Commitment of the principles reads:

*Each new generation of technical improvements in*[electronic products](https://en.wikipedia.org/wiki/Electronic_product) should include parallel and proportional improvements in environmental, health and safety as well as social attributes.*[[22]](#footnote-22)*

**We ask the Special Rapporteur to promote the Gender and Toxics agenda by recommending adoption of the proposals listed above.**

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