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Integrated Sustainable Alternative Strategies
WHAT IS A "COMMUNITY-BASED" LEARNING MODEL?

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Introduction

EPA has initiated an ambitious effort called the Common Sense Initiative to bring together representatives of environmental, environmental justice, labor, government and industry groups to "reinvent" environmental protection within 6 industry sectors. Within the electronics sector, an Integrated Alternative Sustainable Strategies Workgroup has been formed to define a learning model of "cleaner, cheaper, smarter" based upon the environmental health and safety needs of communities and workers. This paper suggests a new strategic approach which attempts to synthesize three of the most important current trends in environmental protection -- the development and implementation of the "precautionary principle", the growing emergence of environmental justice and community involvement, and the reinvention efforts which seek to streamline outmoded aspects of the existing "command and control" environmental protection system. We are seeking your feedback and suggestions ; and particularly your thoughts on whether this approach makes strategic sense as a way of proceeding in the climate of de-regulation pressures. *We need your feedback by **July 24** so that we can bring your comments to the CSI electronics sector meeting at the end of July.*

The first trend, the **Precautionary principle** was adopted internationally as a starting point for environmental policy in 1992 at the global UNCED in Rio de Janeiro, Brazil. This principle stipulates that "where there are threats of serious or irreversible environmental damage, lack of full scientific certainty shall not be used as a reason for postponing cost effective measures to prevent degradation." This principle is the mirror image of the approach of the current U.S. regulatory and legal framework, which increasingly requires a search for the holy grail of "scientific certainty." Regulators and judges now insist that science has to "prove harm" before regulatory control can begin. Philosophers of science know that science cannot "prove anything." It often takes science decades -- sometimes centuries -- to reach a clear majority opinion and there will always be uncertainties, giving rise to nagging doubts, which can only be laid to rest by further study. This demand for scientific certainty leads to the current U.S. approach that promotes risk acceptance and risk management rather than risk avoidance. In the meantime, people continue to suffer. (See *Environmental Health Weekly, # 440)*

The second trend, **environmental justice and community involvement,** has grown over the past 2 decades as communities have come together to protect themselves from exposure to toxic substances. It is based on mutual respect and justice for all peoples, and has focused on disproportionate impacts on low income communities, which are too often communities of color. This trend is also based on the assumption that those people most affected by toxic exposure have the right to effectively participate in those decisions that affect their lives. The Principles of Environmental Justice were adopted in October 1991 at the First National People of Color Environmental Leadership Summit in Washington, D.C.

The third trend, the **Reinvention of Environmental Regulations** has emerged as international competitiveness issues have prompted a "lean and mean" approach to industrial management. It has led to an effort to move away from some of the cumbersome command and control mechanisms that have grown up during the last 30 years. Electronics industry leaders have made compelling arguments that the current regulatory system is incompatible with the industry's strategic needs for innovation and "just in time" manufacturing schedules, but they have not proposed alternative models that can deliver improved performance. This trend has given rise to a series of initiatives at all levels of government to "streamline" regulations and permits in an effort to make government more responsive to its perceived "customers" -- the industrial manufacturing companies -- that have increasingly resisted the expensive and time consuming requirements of the current system. Communitites are increasingly on the defensive in the face of "streamlining" challenges. New strategies are needed to advance the grass roots agenda by linking the first 2 trends to the third in ways that build organizing and improve community and worker protection.

An effort to synthesize these 3 trends presents significant challenges, especially if the goal is to achieve improved environmental and health performance while at the same time reducing unnecessary and/or inefficient governmental oversight. **The key is to develop new models that will re-design the current system to include more authentic participation and engagement from communities and workers in order to assure that both the goals definition and the implementation will be improved.**

The focus of EPA's Common Sense Initiative -- with its emphasis on "cleaner, smarter and cheaper" -- and the President's Project XL -- with its emphasis on superior environmental performance, transparency, worker/community health protection, community participation, and enforceability mechanisms -- provide a potential framework for developing a community based model of improved environmental and occupational health protection.

A community-centered learning model envisions workers and community residents coming together to work with local government and industry officials to continuously improve in the following areas:

** Exposure Reduction
** Emergency response and treatment
** Disease Registry
** Toxics Use Reduction
** Environmental Justice
** Pollution Prevention

The model needs to be adaptive to different kinds of communities and situations, including the following:

** existing as well as new facility sites
** communities with established organizations and functional local governmental structures and those without
** facilities with an organized workforce and independent union as well as those without

Within this context, we propose to develop new models of working together to guarantee better environmental performance and more efficient community based participation in oversight, monitoring and access to information than the current system is able to deliver. The new models may integrate the economic and environmental performance of firms with the needs of their surrounding communities. It may be possible to develop more flexible permitting and regulatory controls while at the same time establishing new models for increased community participation in setting and monitoring enhanced environmental performance goals.

A guiding principle of this approach is proportionality -- which recognizes that there are many steps between the current system and a new "alternative track" system, and that in order to meet the needs of all concerned, the degree and scope of regulatory change needs to be proportional to the increased environmental performance and accountability mechanisms. Under this approach, a fully realized 2 track XL approach would accomplish all of the following suggestions, while a more scaled back 2 track system would incorporate only some of the proposals.[1] The mix of various elements needs to be carefully negotiated.

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[1] Mechanisms for accountability, evaluation, and enforcement of these goals also need to be developed:
** **design** mechanisms to implement the above goals;
** **evaluate** the degree of success in achieving the above goals;
** **assure** that the mechanisms are continuously utilized to accomplish environmental and health goals;
** **enforce** compliance in those situations where the goals are unmet

Background

Electronics is the largest manufacturing industry in the U.S., according to the U.S. Department of Labor, Bureau of Labor Statistics. The industry is undergoing rapid expansion -- some industry projections indicate that up to 140 new semiconductor plants will be built world-wide before the end of the century. The environmental and economic consequences of this rapid growth will be significant and require increased sophistication in developing community and worker based strategies.

There are serious issues of public health and occupational health posed by the electronics industry, because the industry relies on hundreds of chemicals in its production processes, many of which are extremely toxic. The most dangerous categories of chemicals include solvents, acids, gasses and metals. Past practices within the electronics industry have left a legacy of groundwater contamination (there are more NPL Superfund sites in Silicon Valley than in any other geographic region in the country). Likewise, the industry was one of the largest CFC-113 dischargers in the nation until recently, and the semiconductor industry continues to suffer an industrial illness rate of three times the national rate for all manufacturing.

At the same time, the electronics industry is highly adaptive, used to rapid change and short product cycles, and capable of innovation. It is also not wedded to chemical production and use (as are some other industrial sectors), but it is significantly dependent on the chemical manufacturing industry for much of its material supplies and toxics information. There seems to be some significant interest within the electronics industry to reducing current reliance on toxic chemical usage and on reducing exposures.

Within this context, we need to explore various models that will address the challenges we face. Communities face multiple chronic low-level exposure to chemicals used in electronics manufacturing production processes. Communities want to know what they are being exposed to and what the cumulative, additive and synergistic health effects might be. Communities want assurances that exposure limits have been set at precautionary levels to prevent harm, rather than limits set after, and in response to, catastrophic disease and disability. Communities are increasingly aware that precautionary levels are urgently needed for new and untested generations of hazards, as industry processes and innovations evolve.

Unfortunately, sufficient data is not readily available to guide exposure reduction priorities, particularly with respect to multiple chronic low-level exposure. The synergistic and additive effects of exposure to most combinations is rarely well-documented; and there are not enough dollars for environmental health research to cover the field of single substances, much less combinations. For these reasons, surrounding communities must be proactive in gathering information about health effects.

A significant but underutilized potential source of health effects information could be developed by improving the health-effects monitoring of the worker population ~~inside the facility.~~ ~~Occupational exposure~~ limits are the highest legally-permitted levels of human exposure to toxic substances. Environmental exposure of the public to the same pollutants is regulated much more strictly. Observable health effects among workers and the range of levels at which these effects are observed can be helpful in defining variability within species and in setting targets for exposure reduction for the sake of workers and communities.

Industry, workers and community residents need to work together to reduce exposure levels and to help everyone to understand why this is important. Health-based exposure limits (HBELs) are levels calculated to correspond to very little or no known risk of disease (1/million), based on available data[2] and using US EPA standard risk evaluation techniques. Health-based exposure limits are typically levels of exposure too low to measure with current instrumentation. The gap between existing regulations and levels designed to provide health protection is significant, often by several orders of magnitude. HBELs remind us there is a scientific basis for the industrial hygiene principle of lowering exposures as much as technologically possible and as part of a continuous improvement model.

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[2] Studies used as the basis for HBELs often did not evaluate effects on reproduction, lung function, the immune systems, the brain and nervous system, and hormones.

Specific Proposals

Specific objectives could include establishing a process at a potential XL facility that brings together workers and their representatives, community residents and their representatives, and local healthcare providers to approach industry officials to explore one or more of the following proposals. The key is to identify those situations where companies may need to negotiate with communities and workers due to the time pressures of permits, regulatory review, etc.

- The participating company could establish state of the art **exposure reduction programs** for the workforce and community. The exposure reduction plan should be based on a model of continuous improvement that will achieve Health Based Exposure Limits for the workforce and reduce environmental releases until exposure is eliminated. Components of the exposure reduction program could include:

** Injury and Illness Prevention Training for workers which:

a) develops active awareness of chemical and physical hazards in the workplace and symptoms of acute overexposure;

b) ensures that workers understand with specificity what to do to protect themselves and each other and provides immediate access to effective means of health protection;

c) communicates clearly that protecting worker health is of primary importance, supersedes other priorities, such as making quota, and will not be the subject of retaliation. The importance of worker health should be consistent with other messages perceived by workers from management

d) revises trainings in response to health monitoring and disease registry trends (see below), to the cultural and linguistic needs of workers, and to incorporate revisions to Health-based Exposure Limits

e) establishes non-discriminatory transfer policy for pregnant production workers and workers with reproductive concerns

** Comprehensive Health Monitoring which:

a) provides traditional industrial hygiene/workplace monitoring, especially for untested substances from suspect families of chemical compounds (company monitoring)

b) records short term health effects of singular and multiple exposures, including substances, symptoms, frequency and intensity of exposure, through worker self-monitoring and community/citizen epidemiology (worker/community monitoring)

c) reports (or encourages affected worker to report) health effects to the healthcare provider[3] to ensure that appropriate medical monitoring and interventions are pursued in a timely manner, while protecting worker privacy rights[4] (medical monitoring by healthcare provider e.g. serum bile acid assay, liver enzymes panel etc.)

d) reports recorded short term health effects to chemical suppliers and manufacturers for incorporation on material safety data sheets, to improve quality of worker/community risk communication

** Disease Registry

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[3] Primary care providers, including OB/Gyns, generally do not inquire about a patient's occupational exposures and are not familiar with the potential role of industrial solvents in cause disease or reproductive harm (e.g. "fetal solvent syndrome"). The patient generally expects the physician to ask all important questions; because the doctor never raised such questions, it seems no danger exists--especially when same physician does caution about alcohol ingestion, smoking, and "drugs."

[4] Assumes worker health benefits are comprehensive.

We need to bring disease rates down, both in the workplace as well as in the community. From a public health perspective, accurate injury and illness rates are a crucial feedback mechanism[5] for companies to take corrective action (e.g. increased safety factors, use reduction). Disease registry can provide crucial information regarding synergistic health effects, health effects lacking "transparency" e.g. adverse reproductive outcomes, etc.

We need a comprehensive disease registry that accurately documents disease from chemical exposure by building upon comprehensive health monitoring.

** Work with Chemical Suppliers/Manufacturers to:

a) incorporate health effects information to improve MSDS quality (discussed above)
b) disclose all health information in their possession e.g. unpublished studies
c) test for product contamination e.g. TCA containing dioxins, benzene
d) promote market for developing truly safe substitutes
e) establish corporate-wide sustainable standards that are incorporated into agreements among companies, sub-contractors and suppliers.

- Establish continuous improvement in accident prevention and emergency response

- Develop a **toxics use reduction plan** which develops priorities and creates an orderly and timely phase out of known, probable human, and animal carcinogens, reproductive toxins, neurotoxins, mutagens and acutely toxic gases. The priorities of such a plan should be developed in response to comprehensive health monitoring data provided by companies, workers, communities, and healthcare providers. Technology assessments, goals and timetables, safe substitute assessments, materials and waste audits, materials accounting, mass balance, and full cost accounting should also guide the priorities of toxics use reduction.

- Work with employees and community to establish a **life-cycle approach** to all manufacturing, from R&D to final disposal.

  a) design new products from a comprehensive life-cycle perspective
  b) internalize full costs of manufacturing, disposal, worker and community disease
  c) establish a comprehensive policy for return and safe disposal for all used products

- **Establish corporate-wide sustainable standards** that apply equally domestically as well as internationally and which are incorporated into agreements with sub-contractors and suppliers.

** establish comprehensive technical assistance and technology transfer to encourage pollution prevention and workers' health and safety at all stages of production

** hire contractors that follow best practices in labor and environmental concerns

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[5] The workers compensation system illustrates why disease registry is "cheaper and smarter" and ultimately leads to "cleaner". Currently, widespread failure to identify the occupational connection of disease prevents workers and their dependents from receiving timely medical care, income assistance, and job retraining if appropriate, under workers compensation. Sick or disabled workers are often unaware of the occupational cause of their condition and often resort to public assistance–for healthcare, food, shelter, and cash. Without timely treatment, the medical condition worsens beyond the point where job training was an option. These costs, which should be borne by the compensation insurance industry, is being externalized to the public sector, particularly county and city budgets. The aggregate costs are enormous, with families one or two paychecks away from dislocation particularly vulnerable.

** establish corporate policies that go beyond compliance worldwide that exceed the strictest standards

** require that all facilities worldwide disclose toxics release and use information

- The participating company could implement a worker improvement plan and community economic impact statements.

** establish corporate commitment to hiring, training, and promoting local residents

** assure that workers are involved in process design and workplace decision making

** assess environmental, social, and economic impacts of new technologies and new facilities, including the impacts on community resources such as wetlands and other ecological concerns, transportation, education, housing, etc.

** establish a capital investment fund to develop sustainable technology

** establish a comprehensive job impact assessment and re-training program for displaced workers

** establish a comprehensive anti-discrimination plan and union neutrality clause

** establish corporate commitment to pay full share of taxes for new developments in order to assure adequate infrastructure

• Effective Community/Worker Participation and Implementation

In several parts of the country, communities have been experimenting with a "Good Neighbor" approach that is designing new ways for companies and their neighbors to work together cooperatively to bring about environmental improvements. This part of this proposal is designed to develop operating models that can be tried out in various communities that are experimenting with the XL model. Essential components could include the following principles:

a. The participating company could work closely with local communities, workers and local government to ensure full oversight and participation (i.e. a comprehensive "Covenant" or "Authorization" or "Good Neighbor Agreement"). Examples could include:

** establish a sustainable industry committee and commit to an open dialogue with workers and community to assure comprehensive and meaningful participation

** commit to full disclosure of all relevant environmental and health data to the sustainable industry committee including regular monitoring and inspections reports

** commit to funding to support technical consultants for the committee, selected by the committee

** provide advance notice of plant closing, change in technology, and impact assessment of technological changes

** commit to comprehensive and timely cleanup of all contaminated sites and to ongoing community participation and oversight in this process

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