

Rachel's Environment & Health News

#360 - Intelligent Products

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During the last 50 years humans have developed thousands of products for which no environmentally sound method of disposal exists. To help set "acceptable limits" on the damage we do, government developed "risk assessment." Unfortunately, risk assessment fails because (1) it is focused on damage to the "most exposed individual," not the general environment; (2) we will forever lack key information; and (3) science can never provide the needed analytic techniques (for example, health effects from exposure to multiple chemicals are too complex to analyze). As a result, we are now faced with the steady buildup of poisons planet-wide in places and ways that are poorly documented and even more poorly understood.

It is time we turned our attention to re-designing the way things are made. Dr. Michael Braungart at the Environmental Protection Encouragement Agency (EPEA) Environmental Institute has developed criteria for sustainable manufacturing. [EPEA's address: Feldstrasse 36, D-20357 Hamburg, Germany; fax from the U.S.: 011 49 40 4382085.]

EPEA sees 3 categories of products: CONSUMPTION PRODUCTS, SERVICE PRODUCTS and UNMARKETABLE PRODUCTS.

CONSUMPTION PRODUCTS are purchased, then converted by chemical reaction into energy or by-products; examples are soap and food. They are normally used once, then released into the environment. To be compatible with a sustainable civilization, they must be biodegradable (or degradable by non-living systems); they must not bioaccumulate (build up in food chains); they must not cause cancer or birth defects or developmental disorders or changes in the genetic makeup of living things, and they must not exhibit toxicity. Finally, they must be analyzed at the picogram level. (A picogram is a millionth of a millionth of a gram [10⁻¹²]; there are 28 grams in an ounce.)

SERVICE PRODUCTS are goods that provide services, such as automobiles, TV sets, etc. Consumers should not own such products, but should lease them from the manufacturer, who would remain responsible for their ultimate destiny. An alternative would be purchase with a refundable deposit on the item, just as many states now require a nickel deposit on bottles to assure their return. After the product has served its function and has to be renewed, the consumer returns it to the producer, who is responsible for disassembly and recycling.

Return can be achieved via "waste supermarkets" which would accept service products (packaging materials, TV sets, washing machines, etc.). A waste supermarket is not a dump but a compartmentalized source-separation warehouse for various used products. Interim storage would be needed for items for which no recycling technology has yet been developed.

UNMARKETABLE PRODUCTS are those that cannot be consumed or used in an environmentally sound way; an example is waste from aluminum production. These are products (or by-products) for which no recycling technology exists because they are dangerous and because the market provides no financial incentives.

EPEA advocates a "parking lot" storage building for interim, retrievable storage, similar to the above-ground concrete buildings we have described previously. (See RHWN #260.) EPEA emphasizes that the "parking lot" only makes sense if the entire "intelligent products" system is established; otherwise the amount of waste will grow to be unmanageable.

Criteria for safe storage include: no spontaneous combustion; no release of gas; no release of liquids. To simplify retrieval, different kinds of wastes and substances would be stored separately in the building until a satisfactory treatment method was developed. The user of the building has to prove every 3 to 5 years that no treatment

method has yet been developed to prevent, reduce or dispose of the waste in an environmentally sound way. Ownership of the building remains under public control. The owner of the waste remains responsible for the waste (and rents space in the building) and has to guarantee safety and solve any problems arising from the waste. THIS MEANS THAT LOCAL COMMUNITIES WOULD ONLY HANDLE BIODEGRADABLE WASTES.

Advantages of the "parking lot" (above-ground concrete building) concept are: It enforces the "polluter pays" principle; splits responsibility between the owner of the waste and the owner of the building; encourages development of new technologies for specific waste problems; avoids over-capacity of waste treatment facilities; promotes re-thinking of products that now produce unmanageable wastes; discourages waste export and false labeling of waste; puts the market to work minimizing unmanageable waste; encourages re-use of waste because wastes are not mixed together; puts the burden of proof for environmentally sound management on the producer; guarantees zero discharge from the facility.

EPEA has developed five key goals and 25 detailed criteria for all manufacturers:

1. Producers must establish long term environmental goals for worldwide operations, plus dates for achieving these.
2. Chemicals or products released into the environment must be biodegradable and not accumulate in environmental media or food chains. They must not be teratogenic, mutagenic or carcinogenic and they must not be acutely toxic to human beings in the concentrations occurring under field conditions. These chemicals must not disrupt ecological systems.
3. Producers must not produce organisms which disrupt ecological systems. It is the responsibility of the company to prove that this goal is being met.
4. Producers must only use renewable energy resources and must minimize energy consumption.
5. Producers must actively protect the existence of animals and plants in their natural habitats.

Twenty-Five Detailed Criteria

Further criteria are necessary to evaluate fulfillment of those goals. Twenty-five criteria for environmentally sustainable production are listed below. They require from producers:

1. LONG TERM GOALS: Acknowledge long term environmental goals as priorities. The company will make training and education available to the management and staff in order to translate long term goals into reality.
2. GLOBAL STANDARDS: Apply the same environmental standards for products and production and provide enforcement possibilities by independent authorities globally.
3. DECLARATIONS: Make complete declarations of the contents of all products publicly available.
4. ANALYZABLE SUBSTANCES: Produce only analyzable chemicals, so that each substance can be traced to concentrations of parts per billion.
5. DEGRADATION KNOWLEDGE: Have full knowledge of the degradation processes of each product. The degradation should not produce any unknown or potentially harmful interim products.
6. LIFE CYCLE ASSESSMENTS OF PRODUCTS: Conduct life cycle assessments for each product. Production processes for newly developed or persistent, bio-accumulative and highly toxic

substances are top priority.

7. LIFE CYCLE ASSESSMENTS OF FACILITIES: Conduct life cycle assessments for production plants and waste/sewage treatment equipment. The basic elements to include in these analyses are energy, raw material and waste balances.

8. FREEDOM OF INFORMATION: Make all environmentally relevant data and information on the toxicological hazards of its products publicly available.

9. TECHNICAL ADVICE: Ensure that individuals or citizens' groups opposing specific technical processes or facilities can receive technical advice similar to the project's proponents.

10. CATASTROPHIC ACCIDENT PREVENTION: Ensure that production processes and facilities eliminate the possibility of catastrophic accident.

11. PROLIFERATION PREVENTION: Drastically reduce the variety of chemicals produced and only put substances on the market which can be completely defined in chemical and degradation terms.

12. HAZARDOUS WASTE RETENTION: Retain possession of all unmarketable products until an environmentally sound use or elimination is possible.

13. REDUCTION OF NON-RENEWABLE RESOURCES USE: Drastically reduce consumption of non-renewable energy and raw material resources, as well as the production of hazardous wastes.

14. WATER CONSERVATION: Establish closed-loop systems for water used in cooling and production. The quality of the used resources --air, water and soil --will not be diminished during the production process.

15. GROUNDWATER CONTAMINATION ELIMINATION: Avoid contaminating any groundwater either by production processes or by the use of the products themselves.

16. BIOTECHNOLOGIES GUIDELINES: Establish publicly analyzable guidelines on the use of biotechnologies, especially genetic engineering, and translate them into action plans.

17. COMPETITION IN ENVIRONMENTAL ACTIVITIES: Promote environmental protection in order to encourage environmental activities in competing corporations.

18. SPECIES PROTECTION: Acquire an appropriate plot of land to reduce the extinction of animal and plant species.

19. PHASE OUT ANIMAL TESTS: Strive to abolish animal tests and set up a phase-out schedule for this purpose.

20. ELIMINATE WEAPONS: Not produce any biological or chemical weapons.

21. OLD PRODUCT RESPONSIBILITY: Take responsibility for all substances it has produced in the past.

22. LIABILITY ACCEPTANCE: Accept liability for its products.

23. RETURN POLICY: Take back products which cannot be disposed of in an environmentally sound manner. Provide clear instructions to consumers for this procedure, e.g. environmental passport, background information.

24. PHASE OUT UNSUSTAINABLE TECHNOLOGIES: The company will set a time limit and phase-out schedule for the use of

environmentally unsustainable technologies which it now uses.

25. SUPPORT ENVIRONMENTAL ORGANIZATIONS: Actively support international environmental groups and international committees in establishing standardized global environmental regulations and a qualified independent supervisory agency.

Evaluation of production activities according to these criteria eliminates the need for "environmental auditing" which is currently based on non-standardized conditions and conducted by companies voluntarily. Life cycle assessment represents a practical tool for the investigation of production activities only if these criteria are applied.

--Peter Montague

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Descriptor terms: manufacturing; hazardous waste; risk assessment; michael braungart; environmental protection encouragement agency; waste avoidance; pollution prevention; above-ground storage buildings; standards; regulation; accidents; prevention; cbw; waste disposal technologies; environmental audits; auditing; life cycle assessment;