



Pollution Prevention News

Special Issue: Report on Conferences

International
Conference on
Pollution Prevention:
Clean Technologies
and Clean Products
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Conference on
Municipal Solid
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"The Key to a Systemic Approach"

F. Henry Habicht
Deputy Administrator, U.S. EPA

Last week I was at a panel discussion at a university and the moderator asked each of us to name the nation's Number One Environmental Issue. Despite the pitfalls of singling out any one issue, I came up with an answer that seems to crystallize the many issues facing us. That is the problem of "compartmentalization." Over the years, we have managed to subdivide the environment into hermetically sealed environmental programs, such as air, water, waste, and so forth.

The same is true in engineering. In the early days of environmental protection, we developed a discipline called environmental engineering. Other engineers thought that pollution control and environmental quality were entirely the domain of the environmental engineer. Now we have come to the realization that you can't design a plant and worry about pollution controls later. Pollution prevention has to be integrated into everything that we do.

At EPA, we view pollution prevention as no less than a *cultural change* in the Agency and in



society at large. Pollution prevention is the key to a systemic approach to environmental protection.

EPA is now looking at categories of threats to the environment — threats posed by different sectors of the economy — and looking at them as a whole. We are relating these threats to natural systems as well as to human health, and we are developing integrated strategies for protecting the environment.

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1200 Attend International Conference

An International Conference on Pollution Prevention: Clean Technologies and Clean Products was held in Washington, D.C. on June 10-13, 1990. Jointly sponsored by EPA and IACT (the International Association for Clean Technology), the conference offered some 200 presentations and was attended by over 1200 people. Conference organizers had billed the event as one of the first international forums for exchange of information and networking on pollution prevention. The conference was also organized as a "clean conference" at which every effort was made to minimize waste and

enhance recycling of paper products, name tags, etc.

Keynote speakers included Hank Habicht, EPA's Deputy Administrator (see above); William H. Parker III, Deputy Assistant Secretary of Defense (Environment); Barry Commoner, Director of the Center for the Biology of Natural Systems at CUNY; Kathryn Fuller, President of The Conservation Foundation and the World Wildlife Fund; Dr. Mostafa Tolba, Executive Director of the United Nations Environment Programme; and Gerald Kotas, Director of the

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International Conference

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Pollution Prevention Division at EPA. Conference attendees heard a strong message of encouragement for pollution prevention efforts both underway and planned. A number of speakers also underscored the continuing need for clear and concise definitions and statements of strategy for pollution prevention.

"Not Just Another Tool"

As Kathryn Fuller remarked, pollution prevention is not simply another tool in the environmental "tool box." Instead, it must be seen as one of the prime motivating forces in environmental protection, and a key factor in assuring economic efficiency, improved productivity and competitiveness. In line with the international scope of the conference, speakers discussed the global nature of the issues at hand, the need for clean technologies in Eastern Europe, and policies of sustainable development in the developing world.

One theme of the conference was the need for action despite the existence of uncertainty. John Atcheson of EPA's Pollution Integration Branch noted, "our ability to manipulate our environment has far outstripped our ability to understand the effects of that manipulation." Atcheson reported on a recent meeting he had had with several engineers, one of whom complained about the great costs being incurred by society to deal with problems that still have not been conclusively characterized. Another fellow said to the complainer: "You're an engineer. Let me ask you something. If you were building a bridge — what would you do if you couldn't characterize the stresses accurately?" The engineer replied, "No problem. I'd simply increase the margin of safety." Atcheson concluded: "If we do that for a bridge, are we willing to do less for the planet?"

Education is Key

Another major theme of the conference was the need for environmental education and cultural change in attitudes and behavior. The role of schools and universities was particularly underscored. William Carroll, speaking for the World Federation of Engineering Organizations (WFEO), an umbrella group for engineering associations in 85

... Industry must go much further to lower pollution levels in OECD countries. The EPA estimates four out of 10 Americans live in areas where the air is often unhealthy to breathe. Worldwide, 1 billion people face unacceptable air quality.

A study by the United States Congress Office of Technology Assessment estimates 50,000 people in this country and Canada die prematurely each year because of aggravated respiratory or cardiac problems linked to pollution. .

Since the Valdez oil spill, there have been over 10,000 oil spills in this country alone — the latest, another major one, barely three days ago. According to the EPA, over 40 million Americans drink water that contains high levels of lead. Over 20 million pounds of toxic substance attack the environment each year from U.S.-based industries.

In Eastern and central Europe where millions of tons of sulfur dioxide, carbon monoxide, industrial wastes have created ecological war zones. Lead contamination in Poland is regularly 10 times higher than limits established by the relative organization.

Infant mortality rates in Poland, Hungary, and other central Eastern European countries are too high and climbing. Life expectancy rates are dropping. One in 17 Hungarians dies each year because of pollution-induced diseases. In heavily industrialized northern Czechoslovakia, average life spans appear to be 15 years less than the

countries, referred to the Code of Environmental Ethics for Engineers adopted by WFEO in 1985 and noted that UNESCO is working to develop an Oath of Practice for environmental engineers, similar to the medical profession.

In closing the conference, Jerry Kotas noted that it appears relatively easier to change technologies than to change institutional and personal behavior. To date, what has been lacking are the networks and institutions needed to carry technical and economic information to other sectors. Kotas said that a hopeful sign was the emergence



national average. There is an urgent need for pollution-intensive industries in central Europe and Eastern Europe to be retrofitted with clean technologies from the West.

... There is an obvious urgent need for clean technologies to move to developing countries already embarking or heading towards industrialization. There is an urgent need to accelerate economic development in the global south to address strictly poverty and chronic resource degradation. Developing countries on the eve of industrialization must not be saddled with pollution-intensive twilight production technologies. They must have access to new energy efficient, clean technologies. And they must be provided with additional financial resources enabling them to afford these clean technologies....

—Dr. Mostafa K. Tolba
Executive Director, United Nations
Environment Programme

of a number of groups and networking efforts, including the American Institute for Pollution Prevention and EPA's Pollution Prevention Information Clearinghouse, that will help broaden the message to a larger audience.

International Newsletter

Cleaner Production is the new quarterly newsletter of the UNEP/IEO network. First issue: April 1990. For more information, contact: Donald Huisingh, Editor, Penning 5, 52353TD Leiderdorp, The Netherlands.

International Conference

Rubbermaid Recycled Plastics

Recycled plastics are among the fastest-growing markets in the plastics industry today, responding to a massive increase in consumer demand for plastics that contain recycled material. Two years ago, Rubbermaid began to explore the use of recycled plastic resins in manufacturing many of our standard products.

Rubbermaid has now extensively tested plastics recycled from many of the most common post-consumer sources including high-density polyethylene milk jugs and soda bottle basecaps, and polystyrene food packaging foam. We have begun to use these materials in large-scale commercial production. For example, a number of our sidewalk refuse containers are now made with up to 25 percent recycled milk jugs. We plan to soon introduce some of our desktop accessories made routinely with 10 to 25 percent recycled polystyrene packaging foam. Several other products at present can be made with recycled plastics by special order. Rubbermaid products made with recycled plastics meet the same quality standards as those made with all-virgin plastics, and we plan to expand these applications.

The cost of the best quality recycled materials today is essentially identical to that of virgin materials. Our use of recycled plastics is limited only by the quality of available materials. Reasons for limited availability include the Food and Drug Administration's exclusion of recycled plastics from direct food contact applications, problems of contamination and processability, and color (usually only the nearly colorless milk jugs can be used for light colored materials; we use mixed-color materials to make products in black or brown). The best materials come from large processors who control their sources, run their own cleaning and finishing operations, certify the quality and freedom from contaminants, and can supply consistent quantities.

We believe that the demand for recycled plastics will continue to grow, and that demand will exceed supply during the remainder of the 1990s, as a result of continued shortages in the availability of recycled materials. Nevertheless, we are targeting an increase in our consumption of recycled plastics from our current 1 million pounds/year to more than 5 million pounds per year going into 1991, when we would like to see to recycled plastics account for 5-10 percent of all resin consumed in our division.

—Charles J. Lancelot
Rubbermaid Commercial
Products, Inc.
Winchester, VA.

Implementing Incentives: Experience and Expectations

Pollution prevention envisions unprecedented changes in raw materials, products, production processes, and disposal practices. These changes will collide with the inherent limits of traditional regulation, requiring use of incentives for their successful implementation. . .

Incentive or market-based approaches will likely be used as supplements to current regulatory and environmental management systems, not as alternatives or replacements. For most pollution, this country is not writing on a clean slate. Detailed regulatory systems already exist and the power of the familiar cannot be overstressed. No constituency is prepared to scrap those systems for uncertain and potentially disruptive alternatives.

Past experience with incentive approaches will critically shape both future approaches and industry response. EPA and the Congress have already embraced or begun exploring a broad range of incentive-based approaches. For example, EPA's final emissions trading policy (Dec. 4, 1986) has saved

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Measuring Waste Reduction Progress

Reliable data showing where and how much waste minimization is taking place would help further the cause of pollution prevention. Two things need to happen: first, companies need to do a better job keeping track of projects which reduce wastes. Second, the government needs to develop a better understanding of how to collect good data from very diverse manufacturing operations.

For a number of reasons, there are difficulties in collecting sufficiently detailed data. First, and most obviously, when you stop generating waste, it isn't around to measure. Second, in many cases waste minimization projects are not recorded—either they are part of larger projects and the project engineers have other priorities, or the waste minimization is accomplished by production workers who are not called on to measure or record it.

Another difficulty arises from the type of manufacturing operation. It is simpler to quantify waste minimization at a facility that manufactures a single product than at a multi-product facility with combined waste streams.

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Send Us Your 1990 Success Stories...

and we'll publish as many as we can fit in the November/December issue of *Pollution Prevention News*. We're looking for new inventions and technologies, as well as institutional changes in 1990 that will contribute to a significant reduction in waste and pollution prevention in your facility or community. Send short pieces (500 words maximum) with your name and phone number to: Pollution Prevention News, U.S. EPA, 401 M Street SW (PM-219), Washington, DC 20460.

International Conference

Habicht

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Working with our Science Advisory Board at EPA, we are learning how human activities create stresses to the environment and what production and prevention strategies make the most sense. We are building upon the Agency's *Unfinished Business* report of 1987.

One of our most important themes is letting the market work. We are looking to market forces to protect the environment to a greater degree than in the past. This is consistent with President Bush's philosophy of protecting the environment. His philosophy is based on optimism — that people have the ability to solve the most difficult problems given reasonable goal-setting and enforcement by government. This view holds that people and industry should be given the maximum flexibility to innovate and solve problems.

What is the role of government in helping to make this market-based approach work successfully? Get more information out about risks and benefits. We have to build and strengthen our technology transfer networks.

We are working closely through organizations like the National Environmental Technology Applications Corporation, the American Institute for Pollution Prevention, and the National Advisory Council on Environmental Policy and Technology — and internationally, with UNEP, OECD, UNIDO, NATO, and others. This summer we are opening a center for environmental protection in Budapest, Hungary, and pollution prevention will be a top item on the agenda.

The cultural change to pollution prevention will not happen overnight. It will take Congressional action and a major shift in Agency thinking. To accelerate this shift, Bill Reilly and I are encouraging EPA's managers to include an analysis of pollution prevention in every decision that reaches us, whether the decision concerns policy, guidance, or regulations.

We need your help. If we all battle compartmentalization, we can move faster towards pollution prevention and sustainable development, and we will at last come to grips with the environmental problems facing the world.

Incentives

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American industry nearly a billion dollars over the cost of uniform stack-by-stack controls, with equal or better environmental results.

Lead phasedown trading effectively implemented a nationwide marketable permit system for refiners who reduced average lead content of leaded gasoline below a shrinking EPA limit. The approach accelerated a 90% reduction of lead in gasoline while avoiding risks to small refiners and gasoline supplies, and saved several hundred million dollars over the cost of uniform compliance at each refinery. Tradeable ticket systems to stimulate recycling of used oil, newsprint, and scrap tires are pending in Congress. And a risk bubble concept — under which compliance with traditional regulatory requirements may be waived if applicants show that significantly greater risk reduction would result from alternative actions — has effectively been included in EPA's draft pollution prevention bill.

Two major prevention models are mandatory waste minimization audits and reduction plans, and per-pound or differential fees (on TRI inventories or solid waste materials). There are arguments for, but large problems with, each. An alternate route is tradeable phasedown per-

mits. While what follows deals with solid waste, the same implementation issues apply to hazardous waste.

Suppose EPA, instead of mandating reductions by generators, were to issue tradeable permits requiring municipal/private landfills to receive 2% less waste/year for the next 10 years, beyond pending 25% recycling goals. A city like Seattle which recycles 40% would get both assets to sell and a double revenue stream (from sale of credits plus extended landfill capacity). A city like New York which bought those credits to cover excess landfilling would pay a double penalty, since it both exhausts capacity more rapidly and pays Seattle to do so.

This approach would mirror the credit system for used oil, with responsibility imposed on the "end-user" rather than the product producer. It raises classic questions, not least of which is how to credit landfills that shut down. But it could also reward innovative solid waste management steps and provide funds for such measures, while strengthening recycling and recognizing that the test is reduction of overall environmental impacts, not source reduction or reduction of waste *per se*.

— Michael H. Levin
Nixon, Hargrave, Devans & Doyle,
Washington, D.C.

Measuring Progress

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Most of the 30,000 large quantity generators, and more than 100,000 small quantity generators are multi-product facilities. For such facilities, waste minimization progress cannot simply be determined by taking the annual difference in combined waste streams adjusted for average production. If the data for different products are aggregated, true progress in waste minimization may be masked by changes in the mix of products and volume of production; conversely, mix and volume changes can make it appear as though waste minimization has occurred when the actual efficiency of the process, in terms of waste generated per unit of

product, has remained unchanged.

EPA has changed its reporting format for collecting waste minimization data for the RCRA biennial report; however, it is still unclear if the new format will be effective. Our recommendation is that multi-product facilities have a separate section to report total estimated results of waste minimization projects, backed up by adequate documentation. As part of the American Institute of Pollution Prevention Implementation Council, we will be meeting with EPA to improve the data collection process.

— David M. Benforado, P.E., DEE
3M Environmental Engineering
and Pollution Control,
St. Paul, MN

International Conference

EPA and States Look for the WRITE Stuff

EPA is working with six state governments to evaluate at least 30 waste reduction technologies in order to identify ones worthy of being applied industry-wide.

Through the Waste Reduction Innovative Technology Evaluation (WRITE) program, EPA has entered into three-year cooperative agreements with California, Connecticut, Illinois, Minnesota, New Jersey, and Washington. At least five technologies will be evaluated in each state.

The WRITE program originated in the Pollution Prevention Research Branch of the Office of Research and Development (ORD) Risk Reduction Engineering Laboratory in Cincinnati. The program is designed to use knowledge that exists in state and local governments to plan evaluations locally. Another objective is to encourage interaction by government and industry.

Evaluators seek to determine the engineering effectiveness of each technology, measure the reduction in waste volume and degree of toxic hazard to all media, and assess economic return. At the conclusion, they plan to publish performance and cost information.

Soy, Water Inks Tested

In Illinois, EPA is working with the Hazardous Waste Research and Informa-

tion Center and the University of Illinois to evaluate five projects:

- Use of water-based inks in flexographic printing to replace inks compounded with alcohol solvents;
- Use of soy oil-based inks as a replacement for petroleum-based inks in offset printing;
- Recovery and reuse of alkaline zinc in electroplating where zinc cyanide was previously used;
- Use of a batch vacuum evaporative system to recover and reuse chemicals and water in electroplating lines; and
- Recovery and reuse of waste zircon molding sand in foundry operations.

Rinsing Revisited

The Minnesota Technical Assistance Program is performing evaluations of innovative rinsing technologies in the plating, metal finishing, and circuit board manufacturing industries.

MICOM, Inc., a printed circuit board manufacturer in the Minneapolis area, is the subject. Researchers are assessing waste reducing modifications of rinsing equipment following an etchant bath and an electroless copper plating bath.

Baseline information has been collected on the volume of "drag out," which is the liquid that clings to a part being plated. After equipment modification, the drag out and rinsing volumes will be measured again and assessed in light of rinsing effectiveness using the modified equipment.

A Cleaner Cleaner?

The Washington State Department of Ecology is evaluating a technology for recycling acetone still bottoms, banned from landfills under a new state regulation. The project also examines the substitution of water-based cleaners for acetone.

Acetone wastes are generated by a large number of relatively small fiberglass fabrication shops in Washington and elsewhere. Participants in the technology evaluation include a builder of fiberglass



Molten steel casting at Fansteel Corp. in Illinois: zircon sand molds are being recycled.

boats and a company that makes bathtubs, spas and shower stalls.

Researchers are obtaining data on the environmental and economic effects of recycling the still bottoms. In the recycling process, the still bottoms are dried, ground, and reformulated into a resin filler putty that otherwise would be made from virgin material.

If the project is successful, it could lead to the elimination of acetone waste, which is regulated under RCRA.

Innovations Abound

EPA and state agencies are exploring a variety of other innovations.

In California, five technologies were evaluated at the General Dynamics Pomona Division: substitution of spray rinsing and addition of copper recovery on a printed circuit board line; replacement of chromic acid with sulfuric acid in the anodizing process; use of a robotic paint facility to reduce paint waste; paint stripping using plastic bead blasting instead of methylene chloride; and use of freon recovery stills for freon recycling.

The New Jersey Department of Environmental Protection is taking the lead in examining the Zerpel "Zero Discharge" electroplating wastewater recovery system. Other technology evaluations will address cleaning solvent substitution, acid/base recovery/reuse, and electroplating metals recovery.

For more information, call Ivars J. Licitis of ORD in Cincinnati, 513-569-7718.



Plating tanks at MICOM, Inc., near Minneapolis: rinsing methods are being modified.

Interview

Beverley Thorpe, Toxics Campaigner, Greenpeace

PPN: What would you count as Greenpeace's greatest strengths in the toxics area?

Thorpe: Action and information campaigns are probably what we are best known for. We use them as springboards to get our message out to the public, for example to get the issue of clean production onto the international political agenda. "Reduce it, don't produce it" has been our standard banner for quite a few years, and although it sounds simple, it is very effective in conveying the message that the only way to resolve the toxic waste crisis is to eliminate the source of the problem, which is toxic products and toxic waste.

The thing I love about Greenpeace is that you can actually get out and do something! My own particular expertise has been in ocean incineration and the North Sea. Recently all North Sea states have agreed to end ocean incineration totally by next year.

Another success is the commitment on the part of the eight governments bordering on the North Sea to reduce pollution in the North Sea — the most industrialized sea in the world. Prior to 1987 we had just a vague statement of intent; now we have timelines and goals; for example, a commitment to a 70% reduction in dioxins by 1995.

PPN: What are your priorities for the next few years?

Thorpe: Whether through legislation and regulation or through the marketplace, the next step has to be the phase-out of toxic production. From a toxics viewpoint if you look at the most dangerous group, it would probably be the halogenated hydrocarbons. Halogens are an easy group to target since you can already find plenty of substitutes.

Greenpeace stresses, however, that the need for a product itself must be the first consideration. Take, for example, PVC (polyvinyl chloride). Many European countries are already moving to ban non-essential uses of PVC (see accompanying box). But the point is not simply to replace one phased out chemical with another but to take a systems view of production — i.e., do



we need the product in the first place?

PPN: A lot of people wonder what are appropriate roles for individuals, industry, and government in pollution prevention. What's your view?

Thorpe: Ideally what governments are for is to take the lead, for example in procurement of clean technologies. Clearly the public has a role in recycling and in "stepping lightly on the earth," as one of our publications is called. But there is also a need to expose the corporate shenanigans that are going on. The real power still lies in corporate economic and political control.

PPN: As you look ahead, what are you most optimistic about? And what's making you worry most?

Thorpe: It depends what day you ask me if I'm optimistic or pessimistic! Quite often I think it is a losing battle. One thing that gives me hope is the demand for information — I believe this will be one of the saving graces of the environmental movement. The main thing we do at Greenpeace is disseminate information. It's the most powerful tool you can have.

Sometimes, though, I think we're running out of time and that we're deluding ourselves to think that public empowerment will actually keep pace with the level of environmental destruction. The thing that particularly worries me is our discoveries of the hidden chronic effects and interactions of toxic chemicals. These kinds of long, long term effects that we're throwing out to the environment now will extend well into the next two, three or four centuries. . . When people say that we could go for clean production and it's not going to call for drastic changes, I really think they're kidding themselves.

European Phase-Outs of PVC

Polyvinyl chloride or PVC is a widely used and versatile plastics material, found in both durable and disposable goods. PVC is used in packaging such as bottles and bags, as well as in office equipment, floor covering, imitation leather, furniture, pipes and hoses, and toys.

A number of European countries are actively considering phase-outs of non-essential uses of PVC. In Austria in November 1989, a Parliamentary Commission recommended a phase-out of PVC packaging, toys, and non-essential disposal goods by January 1, 1991, and discussed further phase-outs in 1993, 1996, and 2000.

In Sweden, agreement has been reached between government and industry, resulting in a voluntary ban on the domestic use of PVC in packaging, to take effect July 1st. Denmark and Switzerland are reviewing options for banning non-essential uses of PVC or percentage reductions in use. There is also movement in Luxembourg towards creating a PVC-free area as a pilot project.

Concerns about PVC stem from its production, which results in toxic waste products, and its disposal — incineration produces toxic chlorinated hydrocarbons and hydrochloric acid while land disposal can result in leaching of organochlorine substances into soil and ground water. Substitutes such as polyethylene and polypropylene are available for most applications of PVC.

MSW Conference

EPA Municipal Solid Waste Conference

Over 700 people attended the First U.S. Conference on Municipal Solid Waste Management sponsored by EPA's Office of Solid Waste and held in Washington, D.C. on June 13-16. Conference papers were organized around seven topic areas: integrated planning, source reduction, recycling and composting, combustion, land disposal, public education, and special wastes. Proceedings can be ordered through Gerri Wyer at GRCDA, 301-585-2898. Below, selections from among the several hundred papers presented at the conference.

Using Market Research for Consumer Recycling Education

Because the pressure for recycling programs is so high, we tend to rush to get programs out on the street. That rush sometimes overshadows the need for research to determine what kind of program will work best in a geographic area and what messages will best elicit participation.

When we don't do market research, I think we can end up preaching to the choir—because we unconsciously assume our diverse customer populations all view solid waste issues the same way we "garbage groupies" do. All customers are different and they think differently from solid waste personnel.

Market research has helped us communicate appropriate messages, reduce customer confusion, and evaluate what works and what doesn't.

We believe the customer education programs we developed have helped make Seattle's solid waste diversion programs a success. Of the 150,000 Seattle residents eligible for the curbside recycling program, 90 percent are aware of it and 80 percent have signed up for it; 84 percent of eligible residents are aware of the yard waste collection program and 60 percent have signed up for it.

We held separate focus groups for people who were already recyclers and for non-recyclers. But our focus groups taught us that there is virtually no difference between the two groups. Instead, we learned the following:

1. **Virtually everyone views recycling positively.** People do not have to be convinced that recycling is a good thing. They value the concept and feel good when they do it.

2. **Everybody has recycling experience with some material at some time.** However, people often don't think of what they are doing as "recycling."

3. **Each person seems to have a point beyond which recycling seems too complicated or difficult.** Consequently, it is important not to overwhelm people and risk pushing them past their saturation point. If the choices look like all or nothing, they may choose nothing.

4. **Convenience is the key to increasing recycling activity.** People do not view recycling as particularly easy or convenient. Every step of the process presents barriers and will cause some people to drop out. Any measure which makes these steps easier will pay off.

5. **Details are extremely important, and every detail presents possibilities to lose participants.** For example, people are remarkably sensitive to the characteristics of storage containers, including their size, shape, color, sturdiness, and protection from rain and animals.

6. **People are very responsive to what their friends and neighbors are doing.** Recycling activity spreads like an epidemic, especially when it is made visible.

7. **Apply the KISS principle: Keep It Simple, Sweetie!**

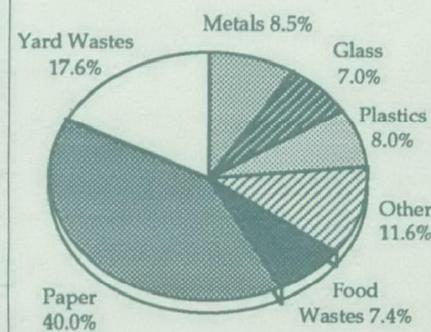
—Ticiang Diangson,
Promotions and Customer Education Coordinator,
Seattle Solid Waste Utility

1990 MSW Update

EPA's Office of Solid Waste released updated estimates on the quantity and characteristics of municipal solid waste (MSW) generated in the U.S. from 1960 through 2010. The report notes the continuing rise in the amount of MSW generated nationally. In 1988, 180 million tons of MSW were generated, equivalent to 4.0 pounds per person per day. The report projects a 10% increase in MSW by the year 2000 in the absence of source reduction.

Of the 180 million tons generated in the U.S. in 1988, paper and paperboard

MSW Materials, 1988 (by weight)



products were the largest component (40%), followed by yard waste (18%). (See pie chart.) Glass, metals, plastics, and food wastes each ranged between 7 and 9 percent of the MSW stream.

Management of MSW has changed in recent years. Landfilling was still the disposal option for 73% of the solid wastestream in 1988, but this was down from 80% in 1986. Recycling of MSW has increased from 10 percent in 1986 to 13 percent in 1988. Incineration has similarly increased from 10 percent in 1986 to 14 percent in 1988.

The complete report, *Characterization of Municipal Solid Waste in the United States: 1990 Update*, is available through NTIS, 703-487-4650 (Order No. PB90-215112). An Executive Summary and fact sheet are available free through the RCRA/Superfund Hotline, at 800-424-9346 (in Washington, D.C., call 202-382-3000).

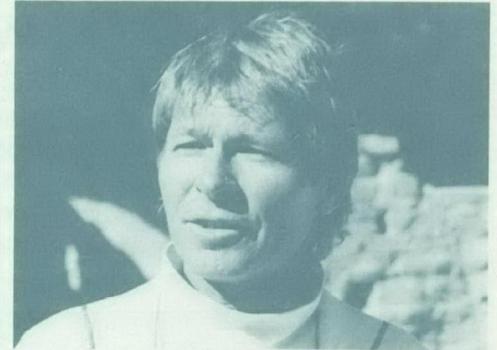
In Partnership With Earth

A new television program, *In Partnership With Earth*, has been produced by Versar Inc. in a cooperative public/private partnership. The one-hour TV show is targeted for national distribution early this summer and will feature EPA Administrator Bill Reilly and singer/songwriter John Denver as on-camera narrators. The program aims to show how both industry and the public can benefit by redesigning industrial processes, and demonstrates the innovative steps some companies, states,

and private citizens are taking to prevent pollution at the source.

The film is cooperatively sponsored by EPA's Pollution Prevention Division and 21 major U.S. corporations. Several environmental organizations provided commentary for the production.

Once the show has been aired, a video-cassette will be available for purchase. For information, contact Michael Alford or Don Feliciano at Versar Inc. in Springfield, VA. (800-2-VERSAR toll-free, or 703-750-3000).



John Denver

Calendar of Events

Title	Sponsor	Date/Location	Contact
9th National Recycling Congress Milestone Conference	National Recycling Coalition	Aug. 20-23 San Diego, CA	Holly Winfrey 202-625-6406
28th International Solid Waste Exposition	Governmental Refuse Collection & Disposal Assn.	Aug. 20-24 Vancouver, BC	Patty Magill 800-456-4723
Prevention, Management & Compliance for Hazardous Wastes (Course)	American Institute of Chemical Engineers	Aug. 20-22/San Diego, CA Nov. 14-16/Chicago, IL	Registrar 212-705-7526
Pollution Prevention Through Facilities Planning	National Roundtable for State Waste Reduction Programs	Sept. 6-7 Minneapolis, MN	Al Innes 612-379-5995
1st Int'l Symposium on Oil & Gas Waste Management Practices	U.S. EPA, others	Sept. 10-13 New Orleans, LA	Mike Fitzpatrick 202-475-6783
EnSol 90: Global Env. Solutions Conference & Exposition	CA Dept. of Health Services CA Env. Affairs Agency, U.S. EPA, Brits 2 Limited	Sept. 12-14 Santa Clara, CA	Rachelle Scheinbach 206-643-7410

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