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Office of Pollution
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EPA

Pollution Prevention News

POLLUTION PREVENTION

Inside:

New Energy Bill Holds Promise for the Environment

Energy efficiency and renewable energy received a major boost in the recently-enacted, 350-page Energy Policy Act of 1992, although neither environmental activists nor the energy industry got everything they wanted. Here are some of the bill's highlights:

Energy Efficiency. The bill uses a mixture of voluntary and mandatory measures to encourage energy efficiency. The bill also requires the Secretary of Energy to create a voluntary home energy rating system for prospective home buyers.

Title I requires new energy efficiency standards for lamps, utility transformers, electric motors, and commercial heating and cooling plus new efficiency standards for shower heads, urinals, faucets, and toilets. It also requires states to adopt energy-efficiency standards for commercial building codes. And the bill sets up an R&D program to promote energy efficiency.

Alternative Fuels. The bill gives a boost to vehicles fueled by ethanol, methanol, propane, electricity, compressed natural gas and electricity, by requiring certain federal, state, and private fleets of cars to increase their numbers of alternative-fueled vehicles. In its energy revenue section, Title XIX, the bill gives consumers a ten percent tax credit on the cost of an electric vehicle. The bill also sets up a research program on electrically powered vehicles.

Electricity. Title VII is one of the bill's most important provisions, making major changes in the electric industry. The bill promotes greater competition by relaxing the regulatory burden on certain producers of electrical power, and by ensuring that wholesale power producers have greater, more affordable access to transmission lines

(Continued on page 11)

State Grants Awarded

EPA's Office of Pollution Prevention and Toxics has awarded $3 million to 16 organizations under the 1992 Pollution Prevention Incentives for States grant program. Since 1989, $15.5 million has been awarded to 56 state organizations. This fourth round of awards was made through a competitive process to state, state entities, and tribal governments for amounts not to exceed $200,000. Recipients are required to match federal funds by at least 50 percent.

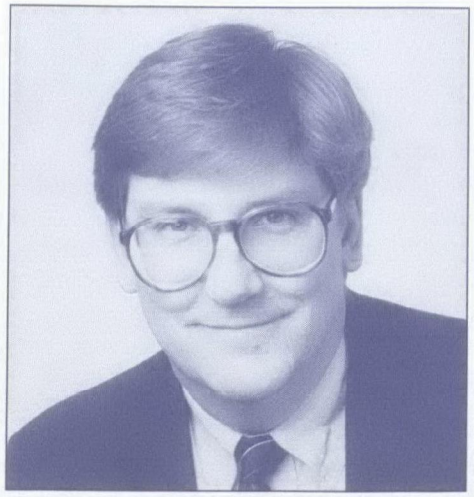
Recipients include: Arizona Dept. of Environmental Quality, Colorado Dept. of Health, Delaware Dept. of Natural Resources, Hawaii Dept. of Health, Illinois EPA, Maine Dept. of Environmental Protection, Maryland Dept. of the Environment, Massachusetts Coastal Zone Management, Montana State University, New Mexico Pueblo Indians, New York Industrial Technology Assistance, Ohio - University of Cincinnati, Rhode Island Dept. of Environmental Management, South Dakota Dept. of Environment, Washington Dept. of Ecology, and Wyoming Dept. of Environmental Quality.

For more information, contact Lena Hann at 202-260-2237.

EPA News

PPD Staff Changes

EPA's Pollution Prevention Division has undergone a change in leadership and a number of other personnel changes. Jerry Kotas, director of PPD since its formation, has left EPA to become Senior Environmental Advisor to the Assistant Secretary for Conservation and Renewable Energy at the Department of Energy.



Dave Kling, Acting Director of PPD

The new acting director of PPD is David Kling, formerly deputy director of the Environmental Assistance Division in EPA's Office of Pollution Prevention and Toxics. In that position, he helped lead EPA's asbestos control programs for schools and commercial buildings, and was involved in the Agency's new lead exposure reduction program. Prior to coming to EPA, Dave served as special assistant to the Federal Inspector of the United States for the Alaska Natural Gas Transportation System. Reflecting on PPD's mission, he notes, "We must continue to translate pollution prevention into terms and programs that are most meaningful and useful to the public, including industry, and which facilitate environmental results."

Other staffing changes at PPD are in the offing as well. Priscilla Flattery, editor of *Pollution Prevention News* since its inception, has moved to another communication and outreach position with EPA's Office of Pollution Prevention and Toxic Substances. A new editor of *PPN* will be named shortly.

NICE^3 Doubles Awards, Goes National

A total of $1.4 million — over twice the funding of the previous year — was awarded to six projects under the NICE^3 (National Industrial Competitiveness through Efficiency: Energy, Environment, and Economics) grants program for FY 1992. The program is jointly administered by EPA, the Department of Energy, and the Department of Commerce to foster new industrial processes and equipment that can reduce the generation of wastes, improve energy efficiency, and enhance the competitiveness of U.S. industry.

The six award winners are:

- *Ultrasonic tank cleaning* to replace solvents — NJDEC and DuPont's Merck Pharmaceutical Division.
- *Electric Tundish* — Ohio Development Agency and Western Reserve Manufacturing Co. of Lorain, OH.
- *On-Site Aluminum Recycling* — Ohio Development Agency and AAAP St. Mary's of St. Mary City, OH.
- *UltraViolet Curing* — Ohio Development Agency and Fasson Films Division, Avery-Dennison of Painesville, OH.
- *40% Recycled Paper* — California Waste Management Board and an industrial partner.
- *Ultrasonic Dishwashing* — California Division of Water Resources, Ultrasonic Products, Southern California Edison, University of CA at Santa Barbara.

Grants awarded under the NICE^3 pilot program in the last two years were targeted to four industrial sectors with high-volume environmental pollutants — paper, chemicals, petroleum, and primary metals — in seven states (CA, IL, LA, NJ, NY, OH, and TX). On November 6, DOE and EPA announced in the *Federal Register* that the next round of awards would be open to national competition for the $2.5 million funds available as grants or cooperative agreements. Applications must be received by April 30, 1993. For more information, contact Technical Inquiry Service, NREL, 1617 Cole Blvd., Golden, CO 80401. Tel: 203-231-7303.

New ACE Grants Awarded

In its third round of funding, 24 new projects across the country have been awarded over $2 million in ACE grants. The ACE (Agriculture in Concert with the Environment) grants program is jointly administered by EPA's Office of Pollution Prevention and the Sustainable Agriculture Research and Education program of USDA's Cooperative State Research Service. The program is aimed at reducing pollution from pesticides and soluble fertilizers and safeguarding environmentally sensitive wetlands and habitats.

The new round of awards reflects the increased diversity of the initiative, with inquiries coming from state- and community-based groups, agricultural cooperatives, and advocacy organizations, as well as the research and academic communities.

(Continued on page 8)

Notice: Due to budget constraints and staff changes, *Pollution Prevention News* was not published in the Fall, 1992. Beginning with this Jan/Feb 1993 issue, PPN will be published bimonthly.

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Technologies

Super-Efficient Refrigerator to Receive a Cool $30 Million

CFC-free refrigerator/freezers that will be 25 to 50 percent more energy efficient than 1993 federal standards will be on the market as early as 1994, say organizers of the Super Efficient Refrigerator Program (SERP). The program plans to jump-start the effort to bring environmentally friendly refrigerator/freezers to consumers years ahead of normal market expectations.

SERP, an EPA-endorsed electric utility program, will use a "golden carrot" approach to bring about the new appliances: Participating utilities will pay out over $30 million to the U.S. manufacturer that designs, develops and brings to the American marketplace the highly efficient refrigerator. The winning manufacturer will be determined through a winner-take-all competitive bid process, and the award will be given only when the winning manufacturer delivers the refrigerators to the utilities' service territories. Because of the manufacturing subsidies, SERP expects the price of the super-efficient refrigerators to be no higher than units that use more electricity and contain CFCs.

Present-day refrigerators use 50 percent less electricity than those made 20 years ago, but "even the most energy efficient units still waste significant amounts of electric power," says Dr. Richard Harkness, executive director of SERP. "Refrigerators and freezers consume approximately 20 percent of the electricity used in American homes, and much of that is wasted." Harkness says that SERP hopes to increase refrigerator efficiency in the next three years on the same order of magnitude as has been accomplished since 1972.

Public and private utilities likely to participate, including Baltimore Gas and Electric, Pacific Gas and Electric and the Long Island Lighting Co., will contribute between $150,000 and $7 million each to the program. The utilities hope the end result of the program will be cuts in power demands, thereby reducing the need for new power generating stations while also reducing emissions of carbon dioxide. Savings to consumer electric bills could reach $240 million per year. "The fact of the matter is that such a refrigerator would not be available to the public for many years if the participating utilities had not come together to provide the incentive for manufacturers to develop the product," says Harkness.

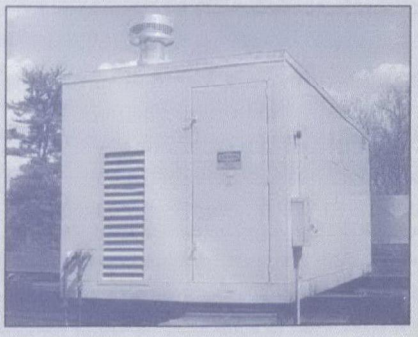
Lawn mower exchange announced

Utilities are also joining forces to tackle another major air pollutant: the lawn mower. The National Consortium for Emissions Reduction in Lawn Care and EPA announced in August a plan to study the environmental benefits of electric lawn mowers by distributing up to 1,000 cordless electric mowers to residents across the country in exchange for the gasoline mowers the residents currently use. The consortium includes the Edison Electric Institute and the Electric Power Research Institute and utilities such as Boston Edison and the Potomac Electric Power Co.

A lawn mower used for one hour produces as much air pollution as driving a car 50 miles. Preliminary studies suggest that switching from new gasoline mowers to electric mowers decreases emissions such as hydrocarbons and nitrogen oxides more than 70-fold, taking into account the emissions associated with the generation of electricity.

EPA will use the collected gasoline mowers for fuel consumption and emissions testing. The results of the testing will give EPA the data called for by a Clean Air Act directive to document emissions from off-highway mobile sources, of which lawn mowers make up the largest portion.

Energy efficiency challenge spurs a new air conditioning system



While the race is on to develop refrigerator designs that are highly energy efficient and CFC-free, innovations are being made in other aspects of cooling as well. One example is ICC Technologies, a small Philadelphia air conditioning company that has a system with the potential to reduce the amount of energy used to cool our homes, offices and stores. ICC Technologies' cooling system uses no chlorofluorocarbons and only a small fraction of the energy of conventional systems.

ICC's cooling system uses a desiccant (drying agent) made of silica and alumina, to take moisture out of the air and make it feel cooler and more comfortable. Conventional air conditioners, in contrast, lower the temperature of the air but also cause the humidity level to rise.

The ICC cooling technology has been installed successfully in more than 40 U.S. supermarkets. ICC estimates that half of the nation's 30,000 supermarkets could use the system.

Resource Round-Up

From Regulations to Industry Compliance: Building Institutional Capabilities. A UNEP report offering guidance to government officials on implementing environmental laws using an integrated approach to encourage source reduction. Available from UN Publications, CH 1211 Geneva 10, Switzerland, or New York, NY 10017.

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Green Advertising Claims. EPA, the Federal Trade Commission, and the U.S. Office of Consumer Affairs have published a short brochure for consumers explaining FTC guidelines and helping consumers understand and evaluate commonly found environmental claims on consumer products. For more information, contact EPA's RCRA Hotline at 1-800-424-9346 (in the Washington, D.C. area, call 703-920-9810).

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The Road from Rio: An Agenda for U.S. Follow-up to the Earth Summit. The Environment and Energy Study Institute has distilled elements of the U.N. conference held in Rio in June and identified 15 initiatives for U.S. action. Cost: $10.00. Contact: EESI, 122 C St. NW, Suite 700, Washington, D.C. 20001. Tel: 202-628-1400.

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Pollution Prevention in Lake Erie and the Great Lakes: Ohio EPA has completed five reports on hazardous waste generation and pollution prevention programs in the Great Lakes Drainage Basin, as follows: *The Generation and Management of Hazardous Waste in the Lake Erie Basin Portion of Ohio; Hazardous Waste Minimization in the Lake Erie Basin Portion of Ohio; Great Lakes State and Provincial Pollution Prevention Programs and the Great Lakes Pollution Prevention Action Plan; Pollution Prevention Case Studies in Ohio's Lake Erie Basin;* and *The Waste Profile Review System and Waste Management Alternatives Plans in the Lake Erie Basin Portion of Ohio.*

Executive summaries are available free; complete reports cost between $5 and $8. Contact: Pollution Prevention Section, 614-644-3469. The Government of Canada has opened a Great Lakes Pollution Prevention Centre in Sarnia, Ontario with a mandate of developing awareness of pollution prevention in the basin. Contact: 519-337-3423.

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Chlorinated solvent reduction in industrial processes is the subject of 11 industry-specific reports and one summary report produced by the Source Reduction Research Partnership. Industries include: chemical intermediates, dry cleaning, solvent cleaning, paint removal, pesticide formulating, and adhesive, aerosol, textiles, food products, pharmaceutical, flexible foam, and electronic product manufacturing. Contact: Dr. David Roe, Environmental Defense Fund, 510-658-8008.

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EnviroLink, a new newsletter for educators in the field of environmental management, is published by the Management Institute for Environment and Business, 1220 16th St. NW, Washington, DC 20036. Tel: 202-833-6556.

For engineering students, another resource is available: ***Pollution Prevention: Homework & Design Problems for Engineering Curricula*** has just been released by the Center for Waste Reduction Technologies at the American Institute of Chemical Engineers (155 pages, $35). Contact: AIChE Sales Department, 345 East 47th St., New York, NY 10017. Tel: 212-705-7657.

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Pollution Prevention Northwest, the newsletter of the Pacific Northwest Pollution Prevention Research Center, is published quarterly. Contact: PPRC, 1218 Third Ave., Suite 1205, Seattle, WA 98101. The PPRC also has a new bimonthly newsletter for companies and organizations putting together a pollution prevention library. Call Pamela Worner (206-223-1151) about getting on the mailing list for *Pollution Prevention LibraryTalk.*

Recycling Update

EPA has announced that the national recycling rate for municipal solid waste rose to 17 percent in 1990, up from 13 percent in 1988. The new data show a significant rise in yard waste composting either in backyards or through large community facilities. Americans produced a total of 196 million tons of MSW in 1990, an 8 percent increase over the 180 million tons generated in 1988. Some 60 percent of the MSW total comes from residential sources. Copies of *EPA's Characterization of Municipal Solid Waste in the United States: 1992 Update* are available from the Solid Waste Hotline, 800-424-9346 (in the Washington, D.C. area, call 703-920-9810).

A recent report by the American Institute of Chemical Engineers estimates that about 20 percent of all trash will be recycled by the end of 1992, and notes that recycling has become a mainstream solid waste management option. However, the report finds it unlikely that the U.S. will reach EPA's national goal of recycling 25 percent of municipal solid waste by the end of 1992. The *Status Report on Municipal Solid Waste Recycling* also explains the U.S. Conference of Mayors' Recycling Index, a working definition of recycling rates that allows comparisons to be made across cities. Contact: Martin Siegel, AIChE, 1707 L St. NW, Washington, DC 20036. Tel: 202-223-0650.

Also on recycling: *Recycling Realities: Facts, Myths and Choices* is a new booklet by Keep America Beautiful, Inc. Contact: KAB, 9 W. Broad St., Stamford, CT 06902, 203-323-8987.

Program Updates

Green Lights On Bright

The Green Lights Program to promote energy savings and achieve environmental benefits by upgrading lighting systems continues to demonstrate its momentum with 668 participants as of October 31, 1992 and some 3 billion square feet committed to the program. The 180 participants that have reported on their progress indicate that 186 million square feet are currently in the "Upgrade Pipeline" (i.e., either being surveyed or upgraded). Average reductions in lighting electricity being achieved are 52 percent.

Region 2 Administrator Constantine Sidamon- Eristoff presents Sharon Landers of Orange & Rockland Utilities with a Green Lights certificate of participation as part of a corporate recruiting forum attended by 20 New York and New Jersey corporations in October 1992. The forum was hosted by Green Lights Charter Corporate Partner, American Express Company and featured case studies of successful Green Lights implementation by American Express and Warner Lambert Company.

Green Lights Partners and Allies receive a wide range of EPA support services, including state-of-the-art software to assist decision making; an in-house training video; two-day workshops; a 400-page *Lighting Upgrade Manual* that guides users in upgrading lighting; and *Light Briefs*, technical fact sheets. Upgrades to date have included a wide variety of strategies and technologies, including installation of T8 lamps, metal halide lamps, motion sensors, electronic ballasts, compact fluorescents, and upgraded reflectors.

The State of Maryland has set an example in terms of a comprehensive approach from the start. Maryland has completed pilot upgrades in six buildings totalling 714,000 square feet. The most common technology was replacing T12 lamps and magnetic ballasts with T8 lamps and electronic ballasts. Other upgrades include replacing mercury-vapor lamps with metal halide lamps, incandescent lamps with fluorescent lamps, and incandescent exit signs with LED signs.

The private sector has demonstrated an impressive array of innovative approaches. White Castle, the oldest fast-food chain in the nation, completed a massive lighting upgrading project covering 700,000 square feet in 238 offices and restaurants located in 12 states. White Castle planned individualized renovations for each space that included relamping, reballasting, and reflector installation. After joining Green Lights in December 1991, Westin Hotels upgraded its 1.5 million square foot St. Francis Hotel in San Francisco, primarily by replacing its 1,624 incandescent lamps with compact fluorescent twin tubes. The upgrade cost $36,000, and has resulted in an annual 82% reduction in energy use and $85,000 in lighting costs.

Monsanto Tracks 33/50 in Annual Environmental Report

Progress on 33/50 goals are among the data presented in Monsanto's 1992 Environmental Annual Review, which also provides detailed information on releases to the environment by plant and by chemical. The company's Pensacola, FL plant reduced 800,000 pounds of cyclohexane emissions through source reduction, modified air pollution control equipment, and energy recovery. Monsanto reports achieving a 66 percent reduction in process air emissions of toxic chemicals from its U.S. operations through 1991, and still hopes to meet its own target of a 90 percent reduction by the end of 1992. Contact: Diane Herndon, 314-694-2915.

Small Companies Jump on Board 33/50 Program

As of mid-November 1992, participation in EPA's 33/50 program had risen to over 1,000 companies, up 37 percent from February. Companies have now committed to the voluntary reduction of 347 million pounds of key chemicals, close to one quarter of the 1988 baseline level of emissions of 1.4 billion pounds. The program aims for an overall 50 percent reduction in baseline emissions by 1995. "The 33/50 program has gotten the attention of the industrial community and resulted in genuine and dramatic reductions in toxic chemicals," notes David Sarokin, 33/50 Program Director.

Many of the nation's largest companies have committed to the program for a variety of reasons, including a desire for recognition of ongoing efforts and hopes of avoiding mandated reductions. Lockheed Corporation, for example, reports a 48% reduction in total emissions, and Eastman Kodak has achieved a 47% reduction primarily through reuse and recycling. ITT is conducting a pilot process safety and pollution prevention initiative at three locations, prompted by the desire to eliminate chlorinated hydrocarbons.

Numerous small companies have also joined the effort. For example, Southline Metal Products Company, a metal drum and pail manufacturer located in Houston, TX, employs about 100 people at a single plant. The company has circulated a survey to its suppliers, asking them to identify which of the 17 targeted chemicals are used in their manufacturing and offering to work with them to find substitute materials or processes. Gerald Mazgiel, who heads the effort at Southline, is pleased with the response. "Some manufacturers have sent back the questionnaire, and a number of others have called to express their interest," said Mazgiel.

Case Studies from EPA's Pollution Prevention Research Branch

The Pollution Prevention Case Studies Compendium *is a compilation of 31 case studies of pollution prevention projects under four EPA technology evaluation and assessment programs. Four case studies are profiled here. The complete document (EPA/600/R-92/046) is available from: U.S. EPA, Center for Environmental Research Information, 26 W. Martin Luther King Drive, Cincinnati, OH 45268, or from the Pollution Prevention Information Clearinghouse (PPIC), 703-821-4800.*

Waste Reduction Innovative Technology Evaluation (WRITE)

WRITE, a technology demonstration program conducted in cooperation with six states and one local government (CA, CT, IL, MN, NJ, WA, and Erie County, NY), performs technical and economic evaluations of technologies designed to reduce the volume and/or toxicity of wastes produced from the manufacture, processing, and use of materials.

The WRITE Program has evaluated technology applications in the areas of paint mixing and stripping, acetone recovery, ion exchange, and CFC replacement/recovery. WRITE's goal is to establish reliable performance and cost information on pollution prevention techniques by conducting evaluations or demonstrations of promising innovative technologies and to accomplish an early introduction of waste reduction techniques into broad commercial practice. WRITE supports the participation of small and medium-sized companies in evaluating and adopting pollution prevention concepts.

Case Study: Computerized Printed Circuit Board Plating System

This study was technically and economically evaluated under the California/EPA WRITE program and was a cooperative effort between EPA's Risk Reduction Engineering Lab (RREL), the California Dept. of Health Services, and General Dynamics Pomona Division. The evaluation was conducted during site visits and additional information was obtained through follow-up conversations. A simple payback for each process was calculated because other economic measures are considered company-sensitive information.

Chemcut Corporation installed a new computerized printed circuit board plating system at General Dynamics in July 1988, at a cost of $4.1 million. The new plating system completely eliminated rinse tanks from the process by use of a unique spray-rinse configuration contained in a transporter hoist system that passes over the plating bath tanks. This computerized hoist system allows the circuit boards to be rinsed for only a short duration after their immersion in a process solution. Rinse water discharge from this new process has been reduced from 60 to less than 10 gallons per minute. This reduction in wastewater discharge allowed for a corresponding reduction in metal recovery system sizing. The use of spray rinse versus a dip rinse can also be a major design factor if water supply limitations must be considered or if space is limited in locating the plating line.

In conjunction with the installation of the new production equipment, Chemcut Corporation was required to provide a non-sludge-producing treatment system for all waste streams generated by the process. This resulted in the installation of a new copper-recovery system using short-bed ion exchange columns and electrowinning technologies. This system now produces salable scrap copper metal, eliminating a major waste stream to the conventional sludge-producing waste treatment system.

Savings in labor and waste treatment were found to be the major cost results, yielding a payback period for the new system of 8.3 years. Annual cost savings of $130,000 in waste treatment and disposal were estimated from the recovery of copper from rinse water and process tank solutions, which were previously treated and disposed as a hazardous sludge. Annual cost savings for water usage were estimated to be $10,000 based on a net overall decrease in rinse-water discharges of 50 gallons per minute.

Waste Reduction Evaluations at Federal Sites Program (WREAFS)

The WREAFS Program focuses on waste minimization research opportunities and technical assessments at federal sites. This year, the WREAFS Program is focusing on providing technical research support to the Tidewater Interagency Pollution Prevention Program which is sponsoring a number of joint EPA/DoD/NASA community R&D demonstration projects.

Case Study: Hospital Pollution Prevention

EPA/RREL and the Department of Veterans Affairs (DVA) conducted this study to find pollution prevention alternatives for minimizing the discarded medical supply wastestream. The need to deliver services under a

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Case Studies

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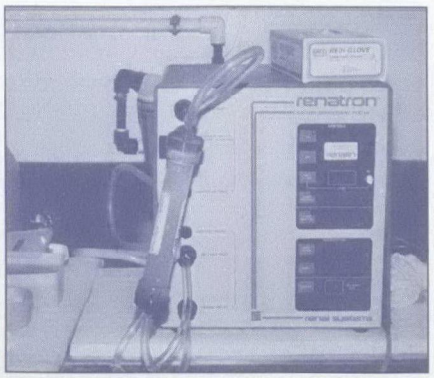
fixed budget had already led DVA to adopt environmentally clean practices on its own. Meanwhile, the use of disposables has increased in the last 2-3 years due to concern over exposure to the AIDS virus.

On average, hospitals generate between 0.5 and 4 pounds of infectious waste per patient each day. The DVA Cincinnati facility (DVA-Cin) produces approximately 0.6-0.87 pounds of infectious waste per patient each day (depending on how calculated), placing it at the low end of the spectrum.

For this study, a site assessment team was assembled with representatives from DVA-Cin, EPA, and an EPA contractor to track the flow of disposables throughout the hospital and to review procedures, uses, and consumption with department heads. The assessment team visited the departments of Laboratory Services, Surgery, Surgical Intensive Care, 5 South (a patient floor), a Medical Intensive Care Unit, hemodialysis, and the outpatient clinic.

The potential for reuse emerged as an area for further research. Suggestions include:

- *Evaluate reuse potential in single-use devices.* Using the rigorous investigation of hemodialyzers as an example, research of other potential reusable single-use devices could be undertaken to gather substantive data to either support or reject reuse considerations for these items.
- *Quality assurance.* Research conducted by EPA in cooperation with health care professions, other federal agencies, and trade associations can form the basis for developing a protocol for reuse, giving hospitals a standard under which to set down operating procedures and institutional policies.
- *Hidden cost factors.* Confusion exists in comparing the relative costs of disposables with reusables. EPA may wish to conduct analytical studies in conjunction with health care facilities in order to fully develop and quantify the cost of using disposable and reusable products as an aid in decision-making.



Reprocessor for hemodialyzer

- *Development of reprocessing capacity.* As health care cost containment gains increasing importance, reprocessing may become cost effective for some items. The potential for promoting some reprocessing capability should be explored, particularly in those areas exhibiting a high-density of medical facilities.
- *Developing a reusable market.* EPA and DVA should consider working together in developing procurement guidelines that will stimulate the production and distribution of reusable and recyclable products.

Waste Minimization Assessments Program

The Waste Minimization Assessments Program is designed to evaluate the use of waste minimization assessments in 30 hazardous waste generating facilities across 10 industries in New Jersey. The assessments, initiated by the New Jersey Institute of Technology, follow the EPA recommended procedures outlined in the Waste Minimization Opportunity Assessment Manual.

Initial industries being studied include electrical power generation, graphics control manufacturing, paints and coatings manufacturing, printing, lubricant production, transportation vehicle maintenance, leather finishing, and educational facilities. (Note: The New Jersey Department of Environmental Protection refers to this program as Assessment of Recycling and Recovery Opportunities for Hazardous Waste, or ARROW.)

Case Study: Local School District (K-12)

The assessment focused on the school district's administration building and the high school which is attended by about 1,000 students. Located at the administration building is a central warehouse for building and maintenance supplies, including cleaners, floor care products, paints, and similar materials. Also at the administration building are a vehicle maintenance and repair facility and a wood shop for building and repairing furniture and related items. At the high school, paper-, computer-, and video-based instructional activities occur. In addition, hands-on instruction in areas with potential for waste generation also occurs in science laboratories, art classes, and vocational educational areas.

The assessment identified empty paint cans, broken or spilled containers of hazardous materials, solvent wastes from motor parts degreasing, used oil, motor engine antifreeze solution, white paper, cardboard, aluminum cans, glass containers, waste chemicals from teaching laboratories, and vapors from art projects as primary sources of waste.

The district already has instituted several practices that have a positive impact on pollution prevention. These include ordering only the quantity of materials that can be used in a single year; stocking the materials near the point of use; converting to the use of dry copiers rather than solvent-based systems; and recycling of paper, cans, and oil. In addition, there has been a concerted effort to change to water-

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based paints and cleaners from solvent-based products and to identify and use other products with reduced potential toxicity in all areas. Wastes such as laboratory wastes are treated as hazardous wastes and collected by a contractor for off-site treatment.

Waste Minimization Opportunities

The elimination of hundreds of empty paint cans could be realized by the purchase of paint in returnable containers. A 100 percent reduction in degreasing solvent wastes could be achieved by enlisting the services of a solvent supply and recycling contractor or acquiring a distillation apparatus. Utilization of antifreeze recycling technology would eliminate 300 gallons of waste antifreeze solution annually. Laboratory wastes could be minimized by using smaller amounts of hazardous chemicals and by improved inventory control. Hazardous art project wastes could be minimized by increased substitution of non-hazardous materials.

Other options were identified that could be considered by the district but may be more pertinent when commercial technology improves. The district uses CFCs in refrigeration equipment and to a limited extent in motor vehicle air conditioning. There is already a commitment to change to substitutes. In addition, as mobile air conditioning becomes more common in district vehicles, a refrigerant recovery and reuse capability should be considered. In some areas such equipment may become a legal requirement. Consideration could be given to joint acquisition with the municipal government of recycling equipment such as antifreeze recycling or degreasing solvent distillation equipment. Ideally, the equipment should be easily movable.

University-Based Assessments Program

The University-Based Assessments Program, a pilot project between EPA and the University City Science Center (UCSC), conducts free waste minimization assessments for small and medium-sized manufacturers who lack the requisite in-house expertise. Under agreement with EPA/RREL, UCSC established waste minimization assessment centers at Colorado State University in Fort Collins, the University of Louisville (Kentucky), and the University of Tennessee in Knoxville to conduct 100 waste minimization opportunity assessments.

Case Study: Manufacturer of Components for Automobile Air Conditioners

This plant manufactures three distinct product components for automobile air conditioners: charged air coolers, round tube plate fin (RTPF) condensers, and air conditioner tubes.

Waste management activities: The plant generates several different types of waste annually. Approximately 40 barrels of spent oil are disposed of off-site. Twenty-five barrels of still bottoms (one-third trichloroethylene, the remainder perchlorethylene) are disposed of off-site. About 1.4 million gallons of process wastewater are treated and put into the sewer, and 255,000 pounds of aluminum and steel scrap are sold for reuse. Twenty barrels of paint sludge are disposed of as hazardous waste.

The plant currently has a solvent distillation unit to recover spent solvent and a secondary still to recover solvent from the first still's bottom. It has virtually eliminated sludge from its wastewater treatment system, and also sells scrap aluminum and steel (for $146,500/year).

Waste Minimization Opportunities

By replacing the chlorinated hydrocarbon solvents with degreasers that can be directly sewered, waste disposal costs would be reduced by $6,007 per year and raw material cost savings would amount to $62,640 per year. The payback period for the $20,700 implementation costs would be 0.3 years. Note that of the 11,000+ gallons of solvent used each year, 92-98 percent are lost to evaporation.

By not feeding water to idle rinse tanks and by converting these tanks to a counterflow rinse system, $33,235 would be saved each year. The payback period for the $3,480 implementation costs would be 0.1 year. By converting present painting operations to electrostatic powder coating, solvent and wastes would be reduced or eliminated. Each year, waste disposal costs would be reduced $5,869 and raw material costs savings would amount to $22,885 per year. The payback period for the $100,640 implementation costs would be 3.5 years.

By fabricating lightweight plastic tops to cover the degreasing units when not in use, solvent evaporation would reduce raw material costs at a savings of $26,375 per year. The payback period for the $3,600 implementation costs would be 0.1 year.

ACE Grants Awarded

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The 24 new projects span a range of activities, including development of sustainable crop rotation systems to minimize the need for chemicals; testing of nonchemical fertilizers such as leaves and chicken manure; the impact of tree windbreaks on the distribution of insect pests and their natural enemies; habitat enhancement for beneficial insects; demonstration of a low-input, sustainable potato integrated crop management program; and economic analysis of farms managed under alternative systems.

Taking into account the various funding formulas, ACE money is leveraged at a ratio of 7 to 1, making the grants a cost-effective means of testing new approaches to reducing environmental damage and health risks through innovative agricultural applications.

Technology

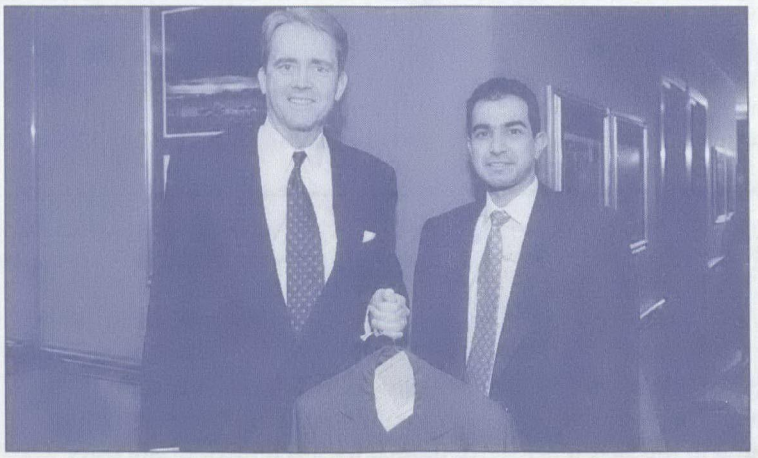
Designing Products for the Environment

Design for the Environment (DfE) is one of EPA's newest programs. Run by the Office of Pollution Prevention and Toxics, DfE aims to support industry in the earliest stages of product design, in order to develop products and processes that eliminate or minimize pollution. Through the DfE program, EPA assists industry in making informed, environmentally responsible design choices by providing standardized analytical tools and making available information on comparative risk and performance of chemicals, processes, and technologies. The first major DfE initiatives are in the areas of printing and dry cleaning.

DfE's Printing Industry Project brings together printers, industry trade associations, and chemical and equipment suppliers with EPA staff to examine the printing process with the goal of finding new processes and chemicals that are safer for the environment but still profitable for business. The DfE Printing Project Team is also evaluating new methods of getting information to small print shops, including televideo conferencing and "comic books" that may supplement traditional meetings and trade publications.

Environmental concerns related to the dry cleaning industry were explored at an International Roundtable in May 1992. The group of dry cleaners and state and EPA representatives examined ways of reducing exposures to dry cleaning solvents. Following the Roundtable, EPA formed a partnership with industry to test a potential water-based alternative that would partially substitute for some of the traditional chemical dry cleaning done in the U.S. The approach is now being tested with the assistance of dry cleaning industry associations and cleaners in the Washington, D.C. and New York areas. Results will be available early in 1993.

To advance its long-term goal of eliminating pollution at the source, DfE's Chemical Design Grants Program is supporting research projects at six universities for the design of new synthetic pathways for chemicals using pollution prevention as a criterion. Grant recipients include Brandeis University; Iowa State University; Purdue University; University of California at Los Angeles; University of Connecticut; and Virginia Institute and State University. The research will explore environmentally sound alternative approaches such as eliminating solvents in some reactions; conducting chemical transformations with sunlight rather than toxic reagents; using naturally occurring nontoxic feedstock for the production of large volume chemicals; and utilization of alternative, recyclable reagents of biocatalysts in place of heavy metals.



Former EPA Administrator Reilly receiving his "wet-cleaned" suit from EPA staffer Ohad Jehassi as part of DfE dry cleaning initiative.

Through long-term research programs and model industry examples, the DfE program is seeking a basic shift in the way that industries and companies manufacture and design products. For more information, contact Bev Boyd, 202-260-1689.

OTA Report Urges Green Products by Design

A report released in September by the Congressional Office of Technology Assessment stressed that better product design can safeguard environmental quality and improve industrial competitiveness, although current regulations and market practices are not sufficient to exploit these opportunities.

OTA emphasizes that the design stage is where decisions are made regarding manufacturing processes — decisions that ultimately determine the characteristics of both industrial and municipal solid waste streams. By placing a greater emphasis on designing to anticipate environmental problems, including disposal, such problems can be addressed in a proactive manner. Examples include redesigning products and processes that use chlorofluorocarbons (CFCs) and reformulating products to avoid the use of toxic heavy metals.

The challenge to policy makers, says OTA, is to choose a mix of regulatory and economic instruments that target the right problems and give designers the flexibility to find innovative, environmentally sound solutions. Such policies include allowing tradeable recyclable credits and negotiating voluntary agreements with industry.

The OTA report also advises against evaluating a product design based solely on a single environmental attribute, such as recycled content. Rather, tradeoffs may be required among competing environmental objectives: e.g., waste prevention vs. recyclability. Copies of the report, *Green Products by Design*, are available by calling 202-228-6204.

Government Purchasing Project Urges Environmental Buying

How can the corporate sector be motivated to produce energy efficient, environmentally sound products and technologies? One option is to use the purchasing power of the nation's largest consumer: the government. Purchasing at the federal, state and local level comprises about 20 percent of the Gross National Product (GNP); federal purchasing amounts to almost 8 percent.

Government demand for fuel efficient motor vehicles, safe cleaning supplies, non-chlorine bleached recycled paper and other products can create markets and manufacturing economies of scale.

The Government Purchasing Project (GPP) was started by Ralph Nader in 1991 to promote responsible government purchasing. GPP is publishing a book titled "More than 40 Ways to Make Government Purchasing Green" which covers solid waste, energy efficiency and hazardous substances. A monthly newsletter, "Energy Ideas," focuses on one energy conserving technology per issue.

GPP is part of a coalition of public and private buyers and the office equipment industry developing energy efficient office equipment. The federal government currently pays roughly $115-150 million annually for electricity to power such equipment. These products also increase building cooling requirements. By using life cycle cost analysis and requiring energy-efficient components in its specifications, government purchases could have a significant impact in promoting energy efficient office equipment.

The GPP also has been actively promoting federal purchases of solar energy. Environmentalists have long stressed that the government could play a major role in providing markets for solar energy. In the 1970s, Professor Barry Commoner wrote that a $500 million order of solar photovoltaic panels would make solar energy competitive with conventional fuels by speeding up the "learning curve," enabling producers to learn and economies of scale to grow.

Uses for solar energy include lighting road signs, parking lots and park sites, heating water, pumping water and powering roadside emergency cellular phones.

Government buying decisions that incorporated environmental and societal "externalities" would set an example for the private sector, advance statutory environmental and health goals, and serve the public interest.

For more information, contact the Government Purchasing Project, P.O. Box 19367, Washington, DC, 20035; 202-387-8030.

Letters

More on PVC

Your story on the regulatory status of PVC (polyvinyl chloride) plastics in Europe that appeared in the December 1991 issue of *Pollution Prevention News* created the strong misimpression that an anti-PVC movement is sweeping Europe. It also contained several inaccurate statements about the environmental impact of vinyl products, which I address below.

▶ PVC *can* be incinerated safely when proper operating guidelines are followed, particularly operating temperature. Tests by the New York State Energy Research and Development Authority in 1987, funded in part by EPA, found that burn temperatures, not the presence or absence of vinyl products, were the key to dioxin formation.

▶ Hydrogen chloride produced by incinerating vinyl wastes can be effectively controlled by following EPA standards for acid gas neutralization.

▶ The vinyl production process is one of the most closely regulated manufacturing processes in existence. All air and water emissions resulting from the process are regulated by EPA and all companies that manufacture vinyl in the U.S. must report their compliance with these standards.

▶ Vinyl products are completely inert in landfills and do not degrade to leach organochlorides or any other substance into soil or groundwater. Post-industrial vinyl scrap is widely recycled and has been for years, and there is no reason why the same cannot be true for post-consumer vinyl.

▶ The industry has known for some time that packaging cheese with PVC film is not advised because of the potential for leaching of plasticizers (additives to PVC), and its use is not allowed. However, there is no similar problem using PVC to package meat, and in fact, flexible vinyl film keeps meat fresher than any other comparable materials.

▶ Post-industrial vinyl scrap is widely recycled and has been for years, and there is no reason why the same cannot be true for post-consumer vinyl. Because of the hundreds of uses for vinyl, it is probably one of the most recyclable materials.

▶ There is no ban on PVC packaging in Denmark, rather a voluntary agreement by industry to substitute alternative materials when feasible. Industry is currently working to relax these standards. The ban on PVC packaging in Switzerland applies only to mineral water bottles. This is the one and only ban in Europe and it is being heavily challenged by the European Commission as a barrier to trade.

The reason vinyl is used so widely today is that it provides certain properties that other materials cannot match. These include such attributes as durability, ease of installation, cost, etc. Were this not the case, vinyl would cease to exist, no matter how vigorously it were promoted.

Robert H. Burnett
Executive Director
The Vinyl Institute
Wayne, NJ

Calendar

Title	Sponsor	Date/Location	Contact
Integrated Energy & Environmental Management	EPRI, AWMA, Amer. Soc. of Mechanical Engineers	March 10-12 New Orleans, LA	Marci Mazzei 412-232-3444
Oil & Gas Environmental Conference	American Petroleum Institute, Gas Research Inst., EPA, DOE	March 7-10 San Antonio, TX	Steve Souders 703-308-8431
Watershed '93	EPA plus 11 federal agencies	March 21-24 Alexandria, VA	Jennifer Paugh 202-833-8317
Corporate Quality/ Environmental Management III	Global Environmental Management Initiative	March 24-25 Arlington, VA	Lisa Grayson 202-429-0776
Pollution Prevention, Reuse, Recycling, & Environmental Efficiency	Air & Waste Management Assn.	April 20-22 Baltimore, MD	Gwen Eklund 512-454-4797
1st Intl. Symposium on Electronics & the Environment	IEEE	May 10-12 Arlington, VA	Tel: 908-562-3878 Fax: 908-562-1571
Pollution Prevention on Low and No-VOC Coating Technologies	EPA, others	May 25-27 San Diego, CA	Coleen Northeim 919-541-5816
Comparative Risks Analysis of Air Pollution Issues	EPA, AWMA	June 6-11 Denver, CO	Si Duk Lee 919-541-4477
Annual Meeting & Exhibition	Air & Waste Management Assn.	June 13-18 Denver, CO	412-232-3444
14th SO_2 Control Symposium	EPRI, EPA, DOE	August 24-27 Boston, MA	Ruseli B. Owens 415-855-2153

New Energy Bill Impacts Environment

Continued from page 1

and transmission services. Supporters of this measure argued that it would strengthen competition, slow rates, and make it easier for those who generate renewable energy to sell power to utilities. The bill also authorizes a five-year, $65 million study of the health effects of electromagnetic fields.

Renewable Energy. Title XIX provides a mixture of tax credits, payments, and federal loan support to encourage wind, closed biomass, solar and geothermal energy facilities and demonstration projects. The bill also creates a renewable energy research program.

Fossil Fuels. Two of the most contentious fossil fuel issues—development of the Arctic National Wildlife Refuge, and automobile fuel efficiency requirements—were dropped from the bill. The bill also contains no restrictions on off-shore drilling. Title XIII includes several measures to encourage "clean coal," authorizing research and development projects for technologies to use coal more efficiently and safely and extending DOE's clean coal demonstration program. Title XIX raises the subsidies employers can provide for mass transit to $60 a month and caps the tax benefits for employer subsidized parking at $155.

Global Warming. Title XVI requires DOE to do global warming studies, assess a range of policies for addressing greenhouse gas emissions, and to create a new position, the director of global climate protection. Title XIX increases taxes on ozone-depleting chemicals.

DOE Announces Waste Minimization Policy

In August, the Department of Energy announced a policy on Waste Minimization and Pollution Prevention as part of DOE's ongoing efforts to improve its management of waste. The policy, which affects all departmental employees and contractors, affirms the environmental management hierarchy and promotes use of life-cycle cost analyses.

The announcement follows the Department's Waste Minimization (WMin) Crosscut Plan initiated in May. The WMin Plan pledged the development of a department-wide agenda and schedule for implementation, and established a Waste Minimization and Pollution Prevention Executive Board.

Quick Notes

Materials Requested for Curricula Development

The National Pollution Prevention Center for Higher Education at the University of Michigan is seeking instructional materials on pollution prevention for undergraduate and graduate business, engineering, industrial design, and natural resources programs. Submissions are welcomed from educators, business, industry, government, and public interest groups. Curriculum materials are being sought in any of the following formats: case studies; closed- and open-ended problem sets; design problems; videos, computer software; and journal articles, textbooks, technical reports.

For more information, contact Gregory Keoleian, tel: 313-764-1412, fax: 313-936-2195.

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DOD Reduces Hazardous Waste

The Department of Defense announced in August that it had reduced its hazardous waste disposal by 53.9% from 1987 to 1991. In June 1987, DOD established a goal of reducing hazardous waste by 50% before the end of 1992. Over 85% of the reduction achieved comes from DOD's industrial-type facilities which account for the majority of all waste generated by the Department. The remaining reductions were generated from such areas as daily installation operations and training facilities. The military's pollution prevention strategy emphasizes four areas: systems acquisition, material substitution, process improvement, and improved hazardous material management.

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Retired Engineers and Scientists: Call ECO

The Environmental Careers Organization (ECO) is seeking retired engineers and scientists to work as technical advisors to nonprofit groups promoting industrial pollution prevention. Six-month projects are available in Boston, Washington, D.C., New York, Chicago, Cleveland, Buffalo, Detroit, Tampa, Seattle, and San Francisco. Technical advisors will receive free training on the latest toxics use reduction methods and regulations.

Applications can be made until February 12, 1993. Contact: Lori Colombo, ECO, 617-426-4375.

NREL Sponsors Building, Wind Research

A new type of performance test that could help improve energy efficiency at home or office—and therefore save money—will be developed and refined under a cooperative research agreement between the National Renewable Energy Laboratory (NREL) in Golden, CO, and Colorado State University in Fort Collins.

The STEM (Short-Term Energy Monitoring) test will measure how efficiently a building uses energy through a system of sensors that will record temperature, airflow, and heat. Architects, builders, and occupants will be able to use STEM to gauge if a home or office is as energy efficient as it was designed to be.

In renewable energy research, NREL recently awarded $7 million in subcontracts to three U.S. firms to help U.S. industry develop turbines capable of generating electricity at 5 cents per kilowatt hour, which could potentially open up the Great Plains and other areas to wind power at costs competitive with electricity from fossil fuels.

Contact: Syl Morgan-Smith, NREL, 303-231-7683.

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