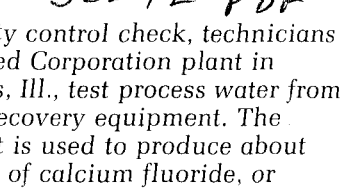
Strong Incentives for Industrial Recycling



In a quality control check, technicians at an Allied Corporation plant in Metropolis, Ill., test process water from resource recovery equipment. The equipment is used to produce about 8,000 tons of calcium fluoride, or fluorspar, each year by reacting two hazardous wastes from another manufacturing process.

by Steffen W. Plehn and Donald Huisingh

Industry can handle a gallon of waste solvent in many ways.

One approach, used too often in the past, is to pour the solvent on the ground. The liquid will almost inevitably find its way to ground water, where a concentration of a few parts per billion can be sufficient to create a risk to health.

A better approach is to burn the solvent in a boiler. The issue of groundwater contamination is avoided, and some usable energy is produced.

A third and even more desirable approach is to reclaim or recycle the solvent. By converting a pollutant with potential for environmental damage into a resource for future human use, a manufacturer can conserve resources as well as provide environmental protection.

Over the past year, both of the authors have been involved with the issue of waste reduction. Steffen Plehn served on a committee of the National Academy of Sciences (NAS) which looked at approaches to reducing hazardous waste generation. Don Huisingh prepared a soon-to-be published book, *Proven Profit from Pollution Prevention,* which is the source of the case histories used in this article.

The NAS committee found that some very potent incentives are now present to encourage industry to reduce the generation of hazardous waste. These incentives are the result of public awareness and concern, which is expressed, in part, in the laws and regulations which EPA is directed to administer.

The first incentive is the increasing cost of land disposal. In the past, the price of land disposal was low and did not reflect the risks to human health and environment or the long-term costs to society of cleanup and environmental degradation. But the price of landfilling is now rising rapidly, and industry is responding to the increased cost.

An example of that response is Allied Corporation's investment of $4.5 million in recycling equipment at its Metropolis, Ill., plant. Allied recovers 8,000 tons of calcium fluoride annually. The inorganic chemical is then used as a raw material at another facility. Since 1982, over 1,000 cubic yards of hazardous calcium fluoride wastes have been recycled monthly, saving about $300,000 a year in disposal and storage costs alone. The process also recovers about 1,000 tons of lime annually.

A second incentive is the prospect of substantial financial liability for remedial activities at Superfund sites, with the risk of third-party liability and adverse publicity as well. These liability risks are often perceived as most severe at landfills. Data General Corporation, which manufactures printed circuit boards for computers, initiated a management policy in 1981 that landfill disposal of wastes should be used only as a last resort. Its program to reduce wastes has included marketing activities to find buyers for its wastes, and new operation practices and development of new process chemistry to make its wastes more saleable.

However strong the incentives, the NAS panel found that the waste reduction process has barely begun. "Most waste reduction efforts in U.S. industry are still in their early stages," the report stated. "Many opportunities exist for reducing the generation of hazardous waste." The problem was not perceived as technologically complex. "At the current stage of development of industrial waste management processes across the country, substantial progress in reducing the amount of hazardous waste generated can be achieved by employing relatively simple methods that entail modest capital expense."

That fact—that much waste reduction is rather simple to accomplish—is documented in the following examples:

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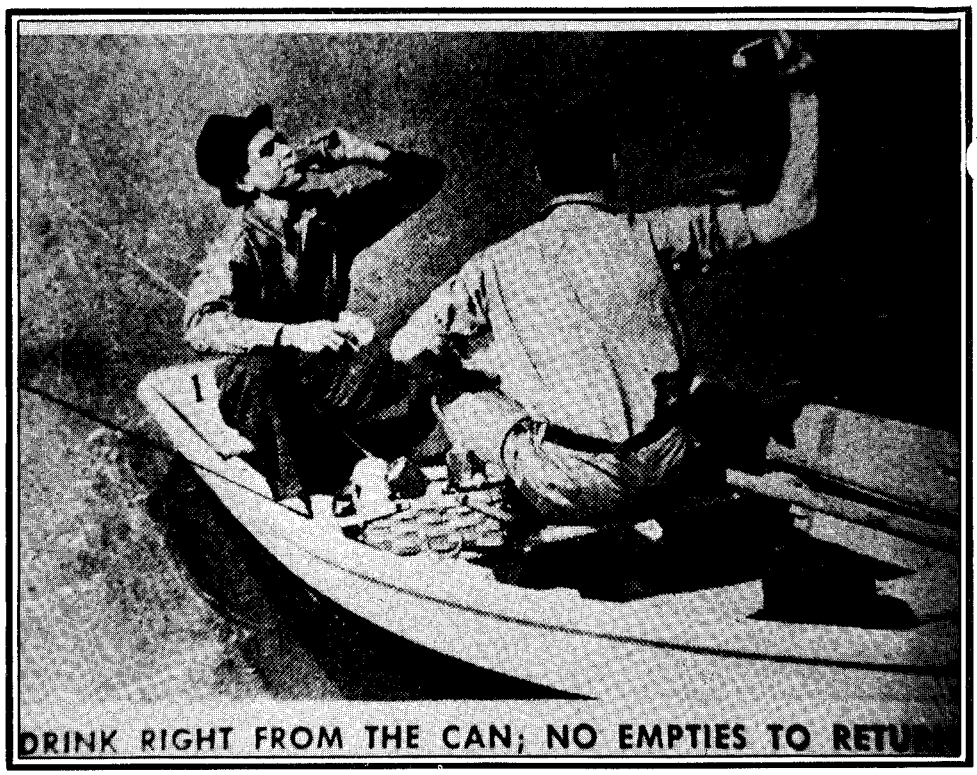


In the days before littering was a major public concern, this ad portrayed a carefree fisherman tossing an empty can into a lake.

bandwagon. Nearly 100 glass plants launched bottle-buying campaigns, and the steel can industry developed a price support program to underwrite the efforts of recycling collectors.

With a solid waste disposal crisis confronting more and more communities in recent years, the public has been made aware of the problems of trash. Garbage is no longer out of sight, out of mind.

Waste production, not waste disposal, is the major problem.

As city councils and town boards studied the options, they soon realized that we just have too much garbage. Waste production, not waste disposal, is the major problem.

And in some communities, citizens have taken action to educate other consumers about over-packaging and about environmentally senseless packaging. For example, a handful of New Jersey and California communities have launched campaigns that involve placing tags on grocery store shelves that rate packaging. For example, a green tag might be used for a refillable soft drink bottle, a yellow tag for a recyclable soft drink can, and a red label for a non-recyclable plastic bottle. Shoppers are then informed of the tagging system and encouraged to select the environmentally proven container.

Though consumer recycling has grown by leaps and bounds and there are efforts to educate citizens about excess packaging, packaging waste grows. A number of states, fed up with overflowing landfills and a littered landscape, have adopted legislation aimed at reducing packaging wastes.

The most famous piece of legislation is the container deposit law enacted by nine states. About 20 percent of the American population lives in communities where deposits are required on beer and soft drink packages. Typically, consumers in those states return some 90 percent of the deposit containers to retailers or redemption centers. The bottles and cans are then sold for recycling, although current plastic recycling markets are so weak that some plastic soft drink bottles are placed in landfills.

Other states have gone in another direction by taxing consumers to fund packaging cleanup efforts. Called litter-tax programs, these projects also attempt to educate citizens about litter problems. Generally, packaging producers and retailers favor litter-tax campaigns over deposit legislation. Less than 10 percent of the population lives in states using this alternative.

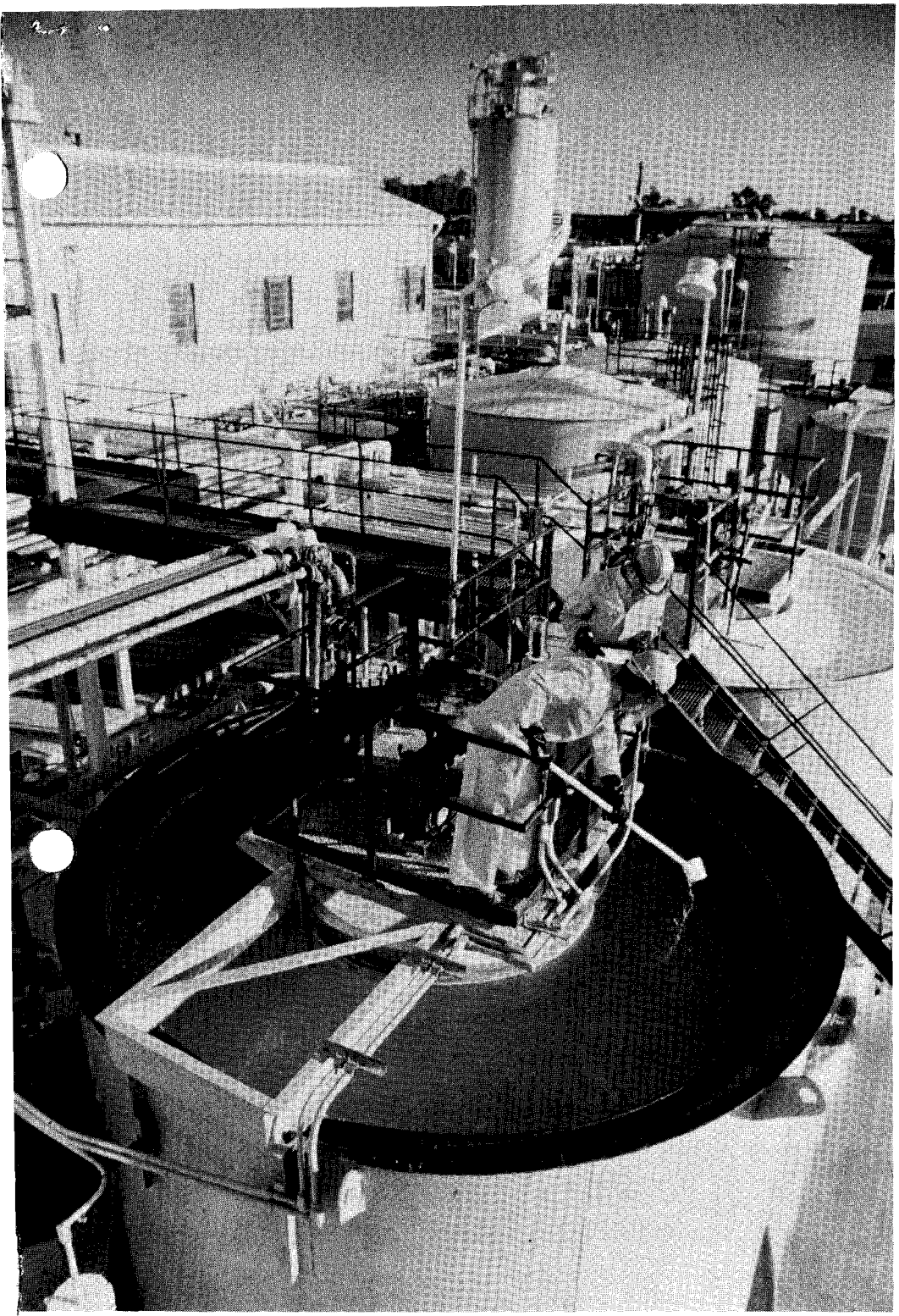
Now several states are trying to force the packaging industry into constructive action by passing legislation restricting the use of certain types of packaging. This strategy was first used by Minnesota several years ago when it passed legislation that would restrict the sales of new forms of packaging if such items were found to be more environmentally harmful than existing packaging. The Minnesota system was never put into place due to a number of legal hurdles.

This hasn't stopped other states from trying to retard the growth of non-recyclable packaging. At least six states are considering restrictive legislation this year. For instance, the Oregon legislature may adopt a measure that gives the plastics industry a few years to implement a plastic milk jug recycling program. If industry fails to do so, plastic milk jugs would be banned.

New Jersey has gone a bit further. A mandatory recycling measure supported by Governor Thomas Kean calls for recycling goals to be set for troublesome items such as plastic and bi-metal packaging. Like Oregon, it allows industry a window of opportunity to establish a viable recycling program. If that effort doesn't attain a 55 percent recovery goal, a deposit on such packaging would be initiated, with the funds going for recycling program development. If that second effort falls flat, the items would be banned.

While to date no state legislature has adopted such a measure, there's growing interest from a number of states. The consideration of drastic measures symbolizes the increasing frustration of many decision makers over burgeoning solid waste volumes. Industry is getting a clear message: solid waste reduction and recyclability should become packaging design factors.

In addition, the packaging industry is hearing the concern that it's not doing enough to aid the recycling of packaging. Some industry sectors are beginning to respond. For instance, the plastics industry and others have established the Plastics Recycling Foundation. With a planned $5 million budget, the foundation will develop and promote plastics recycling technologies. Similar efforts are needed if we are to reduce the volume of packaging wastes. □



Allied Corp.

• Daly-Herring Company manufactures pesticides and insecticides. The company altered its dust collection equipment so that waste streams coming from various production areas are now collected separately rather than mixed in a single baghouse. The collected materials are no longer contaminated by alternate waste streams, and each is recycled back to the process where it was generated. The firm has eliminated over $9,000 in annual disposal costs and estimates the recovered material is worth more than $2,000 per year.

• Deere and Company reduced its hazardous waste 80 percent by "volume" and over 99 percent by "level of risk" through two key actions: first by implementation of a comprehensive corporate hazardous waste management initiative at each manufacturing unit; and second, by construction of an on-site liquid hazardous waste treatment facility capable of reclaiming waste organic oil compounds and metals from process water, producing a non-hazardous sludge. The recovered oil is sold to an oil recycling firm or reused for machining processes.

• Duke Power Company is one of the major electric power generating firms in the State of North Carolina. A team of staff members was assembled to develop comprehensive low-level radioactive waste reduction strategies. One of the elements of the resulting program was an effort to improve housekeeping activities. Compactible materials suspected of radioactive contamination were segregated by area within the plant into "potentially contaminated" and "not contaminated." Since a significant portion of the material was free of radioactivity, this procedure significantly reduced the amount of hazardous waste requiring disposal.

While basic forces are pushing waste reduction in the right directions, the NAS committee was clear that more needs to be done. Direct government regulation of manufacturing processes was not recommended. Instead, the committee favored an emphasis on access to information about waste reduction. Through a variety of means —education programs, conferences, workshops, and technical assistance—and a variety of institutions—universities, state agencies, trade associations—the emphasis must be on wider dissemination of information on the opportunities that are available and the techniques that have worked. Such assistance is particularly important for small business, which is the segment of American industry most in need of help. □

Pest Management: Pursuing an Environmental Dream

by William Jordan

U.S. Dept. of Agriculture

The pioneers of modern integrated pest management (IPM) had a dream. They saw a time when pests would be controlled by manipulating their ecology. They reasoned that if pesticides must be used—as the founders knew they must—then they would be used like medicine, prescribed by specialists in limited doses for a diagnosed ill, and integrated into the overall ecosystem. Robert van den Bosch, a fiery environmentalist who helped develop the basic concepts of IPM, used to say, "We can work out integrated control for any crop in the world, and if we can just get 'em to use it, it'll save their 'fanny.'"

What is practical is what brings in this year's crop* and *saves the agro-ecosystem for future crops as well.

Even though these pioneers were university men, theirs was a practical dream. To a farmer it may have seemed idealistic, because to a farmer what is practical is what brings in this year's crop. But to an ecologist, what is practical is what brings in this year's crop *and* saves the agro-ecosystem for future crops as well.

It was a long-term, panoramic dream, and it came alive under the overcast gloom of *Silent Spring*. The goal was to create an agricultural ecosystem that could be sustained perpetually. One of the first steps was to reduce the amount of pesticide used; as a very attractive side-effect, the costs would also be cut.

Has the dream come to pass? Looking back over the past 15 years or so, the answer appears to a very equivocal "yes and no."

On the positive side, there is no doubt that IPM can be made to work. Cotton in California's San Joaquin Valley is a key example. Cotton is the biggest cash crop in the state, and it used to be the largest consumer of pesticides. Fifteen years ago it was common for farmers to spray 10 to 12 times per season for a conglomeration of bugs and worms straight out of a nightmare. Old-timers talk of schedules where they sprayed on the same morning each week whether the fields appeared to need it or not. Today a typical ranch sprays 1 to 1½ times a season for mites, and it sprays only if an application seems warranted. IPM specialists keep a careful watch on pest species throughout the season, recommending a pesticide strike only when the infestation reaches a proven danger point. As a result, pesticide costs are tremendously reduced and the yields are as high or higher then they've ever been.

Other examples exist around the country. Alfalfa, apples, soybeans, and California citrus are considered classic successes. If you accept the view from the U.S. Department of Agriculture (USDA), the list goes on from here. Cranberries, hay, rice, raspberries, potatoes, and peanuts, to name a few, have all needed less pesticides or

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