

Solid waste management is an area in which innovative research and development activities are sorely needed. It is possible to put a rough price tag on the desirable level of research and development funding, if the practice of industry is used as a yardstick. Ordinarily industry invests something on the order of 5 percent of its gross income on research and development. These funds are used for basic research, the results of which may have no immediate practical applicability, and for efforts to improve quality of output and reduce costs. A segment of industry involved in an area of rapid technological change or growth may invest as much as 10 percent annually in research and development in order to secure a position in the forefront of technological advancement, and thus to maintain a competitive advantage.

The solid waste management field is somewhat analogous. Solid waste collection, processing, and disposal cost the Nation in excess of \$3 billion each year. Since this is a field in which technological innovation is needed and will have to be paid for, it would seem reasonable to assume that an amount equal to 5 to 10 percent of the annual solid waste "business" should be invested in research and development—that is, somewhere between \$150 and \$300 million a year. In our view, taking into account the public health aspects of the solid waste problem as well as its economic, technological, and public policy ramifications, annual expenditures for solid waste research and development would best be allocated in the following way:

Public health and environmental pollution control, 50 percent;

Solid waste technology improvement, 35 percent;

Public administration, systems analysis, cost-benefit analysis, 15 percent.

A division of funds such as this is, of course, not without some areas of overlap. Technology improvement, for example, would have to take into consideration the public health implications of new, experimental techniques and procedures.

By no means all of the cost of solid waste research and development on this scale should be borne by the Federal Government. State and local governments should be expected to contribute, but industry should assume responsibility for a major share of these costs, particularly in the area of solid waste technology improvement. This assignment of funds should assure rapid progress toward the control of environmental health hazards associated with solid waste generation and disposal.

Question 3: During his testimony, Mr. MacKenzie indicated that there were numerous laws and regulatory codes which inhibited or appeared to inhibit progress or enforcement of pollution abatement action. Please furnish a list of such laws and regulatory codes and the extent to which such laws and codes interfere with pollution abatement and enforcement.

Answer: Mr. MacKenzie's testimony on this point was given in response to a question on whether more rapid progress could be made by spending more money for air pollution abatement. This was Mr. MacKenzie's response: "I think one of the impediments to making more rapid progress than has been indicated in Mr. Cohen's statement relates to the existence and scope of activity of State and local government regulatory control activities. I would like to point out to the