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REPORT

of the

ENVIRONMENTAL ENGINEERING COMMITTEE
SCIENCE ADVISORY BOARD
U. S. ENVIRONMENTAL PROTECTION AGENCY

on their review of a report entitled

"POLLUTION CONTROL TECHNOLOGY RESEARCH AND DEVELOPMENT:
PRIVATE SECTOR INCENTIVES AND THE FEDERAL ROLE
IN THE CURRENT REGULATORY SYSTEM"

October, 1985

INTRODUCTION

The Environmental Engineering Committee of the Science Advisory Board was requested by Mr. Carl Gerber, Director, Office of Environmental Engineering and Technology (OEET), at a meeting on November 27-28, 1984, to review a report prepared by the ICF Corporation entitled "Pollution Control Technology Research and Development: Private Sector Incentives and the Federal Role in the Current Regulatory System." This review was a part of a continuing series of interactions between the Director of OEET and the Committee, and reflects the Committee's continuing interest in and support for the technology R & D program in EPA.

The Committee accepted the project, and formed a Subcommittee, chaired by Dr. Davis L. Ford, and including as members Dr. George Hidy, Dr. Joseph T. Ling, Mr. George Green and Mr. Allen Cywin, to conduct the review. The Subcommittee's work was conducted primarily by mail, and their comments were presented to and discussed by the full Committee at its meeting on October 21-22, 1985. The following comments summarize the report.

DESCRIPTION OF THE ICF REPORT

The objectives of the report authored by ICF and submitted to EPA are:

1. To develop a conceptual framework which can be used to determine what amount of pollution control technology R & D is optimal from society's perspective.,

2. To identify any types of pollution control technology R & D which are not being carried out to a sufficient degree by the private sector in the current regulatory system, and

3. To propose ways that EPA can encourage or work to ensure that more of that R & D is done.

The background information which was presented in support of these objectives was organized into three chapters and one appended document. The first chapter outlined the conceptual approach which clarified the classic free market economic theory and presented support information such as R & D expenditures as a function of firm size, benefits from a new product, and social benefits of subsidizing private sector R & D. This chapter basically outlined economic theory and its application relative to the social and financial benefits of R & D.

The second chapter, entitled "Adequacy of Pollution Control Technology Research and Development," presented an overview of U. S. pollution control expenditures and cited various tables in that regard. A significant portion of this chapter was dedicated to automobile emission controls with other topical discussions including basic research, electric utility control costs, municipal wastewater treatment costs, drinking water treatment costs, and hazardous waste control technology.

The third chapter, "Solutions to Pollution Control Technology R & D Problems," outlines the basic problems involved with R & D, such as regulatory uncertainty, short compliance time and legal constraints. Topics include federal government funding of R & D projects, criteria for EPA support of proposed R & D projects in private sector, and a proposed control technology format for evaluating specific projects.

The appended material, entitled "The Potential for Private Sector Cost Sharing in EPA Sponsored Programs" and prepared by another contractor, went into some depth relative to the issues of cost sharing. Specifically, the important issues in cost sharing were outlined, the advantages and disadvantages of cost sharing were cited, and suggestions were presented for further consideration.

As background information, it should be recognized that EPA is charged with establishing water quality and effluent criteria, enforcing those criteria, establishing monitoring programs, and financially supporting municipal wastewater projects. The Office of Research and Development (ORD) basically is charged with sponsoring research which supports regulatory and operational programs, and providing the long term research relative to risk assessment and risk management.

One must also understand that there are disincentives for the private sector to fully support R & D programs. First, the industrial sector, which discharges water or airborne pollutants into the environment, has little economic incentive to develop technologies which significantly reduce the emission of pollutants below permit levels, knowing that such technology may result in lower emission standards. Secondly, most of the pollution control companies are intermediate in size ($200,000,000 to $700,000,000 per year in sales) and do not have the financial strength to devote significant resources to research and development. In any budget reduction, it is axiomatic that the first area of reducing overhead monies is in the area of research and development. It is further recognized that pollution control is considered a "cost center" as compared to a "profit center" and uneven or lax enforcement has provided even more of a disincentive for industry to spend significant amounts of money on pollution control R & D. All of these disincentives are underscored when it is recognized that capital spending for pollution control adjusted for inflation was down significantly in the early 1980 s as compared to the previous decade. Many people currently view return on pollution control investment as not being worth the risks, resulting in inordinately low R & D expenditures by the private sector. Moreover, if industry tries to put into practice a new idea which does not work efficiently, they are liable for the consequences for not meeting their permit standards. For further information see:

(1) Dr. Terry W. Rothermel, et al., The Economic Effects of Environmental Relations on the Pollution Control Industry, prepared by Arthur D. Little, Inc., Sept. 1978

(2) McGraw Hill Publications Co., Economics Dept., Fifteenth Annual McGraw Hill Survey of Pollution Control Expenditures, 1982-1985.

The Environmental Engineering Committee of the Science Advisory Board passed a resolution and presented it to the EPA administrator in October, 1983 (see Attachment A). This resolution outlined the disincentives that industry has for improving pollution control technology as previously described, and emphasized the need for EPA to make a strong effort to "establish cooperative research, development and educational efforts with the public and private sectors and with academia so that effective control technology can be developed, demonstrated and implemented." It further resolved that EPA should:

(1) Consider research on control technology not only for high risk technologies, but also for improved and innovative technologies.,

(2) Undertake a clear evaluation of the limits in terms of toxic and nonconventional pollutant removal and reliability of performance, and

(3) Co-fund with the private sector cooperative efforts that will develop and demonstrate improved control technologies.

SUMMARY OF COMMITTEE COMMENTS

The Committee, in its review, found that there were some areas of agreement, and other areas in which it disagreed with the Report's statements or conclusions. In the area of agreement, the Committee finds that:

1. The report appears to be much better balanced and reflects more objectively some of the issues and viewpoints than was evident from the verbal commentary received during the ICF briefing in November, 1984.

2. The report sufficiently covers the economic issues and their relation to R & D in certain example technologies.

3. The suggestion of incentives for partial funding by EPA using the co-sponsorship technique is reasonable and will have to be a relatively large fraction of the development to be helpful to the private sector. The existing tax incentives probably are insufficient in stimulating the development of new pollutant technology. As municipal entities and the public sector of the utility industry are exempt from taxes, incentives must come in the form of an increase in efficiency and/or reliability. Moreover, R & D expenditures expended by public utilities can be included in the rate base as an additional incentive.

4. The issues of disincentives for R & D in pollution control technology are well treated in the ICF report.

5. The report states that, "The net effect is that in the absence of federal tax benefits or subsidies, profit from investment in R & D will be low from the national perspective." The Committee agrees with this statement.

6. The report quite properly notes the impact of lag time between the passage of legislation and its implementation. The complexity and delays that have been involved in the promulgation of the regulations following statute passage have resulted in regulated firms delaying compliance as long as possible which provides additional disincentives for new technology R & D to be undertaken until these regulatory requirements become clarified.

7. The report properly underscores the concept that once emission rates have been established based on best available technologies, there is little incentive to develop new technologies with lower emission rates. The prevailing thought here is that the development of lower emission rate technology will only lead to across the board tightening of emission standards.

8. The seriousness of underinvestment in R & D in the municipal sector is quite properly emphasized. Virtually no municipalities or pollution control manufacturers perform much municipal wastewater treatment R & D.

9. The discussion of the alternatives to 100% federal funding of control technology R & D is comprehensive and provides excellent ideas for implementing alternatives. For example, the concept of non-profit research institutes, emission fees, and cost-sharing joint ventures are a laudable idea and should be seriously considered.

The Subcommittee disagrees with the ICF report in the following respects:

1. The report does not seem to recognize the importance of the Federal government role in developing pollution control technology, in that such technology is perceived to be more in the public interest than in the interest of a particular industry.

2. The report fails to recognize that one of EPA's predecessor agencies (FWPCA) was very successful in using R & D programs and demonstration grants to stimulate innovative development by manufacturers as well as by equipment and pollution control technology users.

3. The report fails to recognize the fact that budgetary limitations preclude the demonstration of pollution control technology at the pilot or full scale levels. There is concurrently a need to maintain within EPA sufficient high quality expertise to critically evaluate these levels of demonstration. Within ORD, at least, this capability is rapidly being lost through neglect and lack of funding.

4. The report does not sufficiently highlight concerns for hazardous waste control measures. Legislation addressing hazardous waste clean up, namely CERCLA, neglects an R & D set-aside for systematic development of safe, efficient and cost effective technology to better handle or destroy toxic materials on a large scale. This R & D capability is sorely needed if we are to meet national goals of clean-up and maintenance of clean conditions.

5. An area for R & D incentives, which is not discussed in the report, is the need for methods to be developed that will convert waste materials into usable products. This need has been discussed for many years but seems worthy of some continued government assistance. Since this is high risk, high technology, EPA would have to be involved, but this probably would give a high return to the public.

6. The ICF report's section on hazardous waste control is not up to date and inadequately addresses the subject. For example, all of the implications in the RCRA Reauthorization Bill are not incorporated into this report. Since EPA had a cut-off date with a contractor, this is understandable. However, the need for EPA R&D in this area should be updated to incorporate some of the aspects of the Reauthorization Bill.

RECOMMENDATIONS

The Committee agrees with the recommendations presented in the ICF report. These are summarized as follows:

1. There is a need for a Federally and privately funded R & D program for pollution control technology. It is seriously underfunded at the present time.

2. Further investigation should be made into alternative approaches to the current system for R & D funding by EPA.

3. EPA cost sharing/joint ventures with private industries should be increased wherever feasible.

4. The agency should investigate the feasibility of establishing additional control technology research centers. As an example, there is a particular need for municipal treatment technologies.

5. EPA should implement a more stringent and internal review system for control technology development projects.