

Capital Formation Options to Finance Pollution Control

Scott C. Whitney*

The economic cost of environmental pollution and the cost of implementing far-reaching corrective measures are increasingly recognized as significant national problems.¹ Extensive effort has been expended in recent years to analyze and quantify pollution abatement and control costs and forecast capital demands that will be necessary to comply with environmental laws and regulations.²

* Professor of Law, Marshall-Wythe School of Law, College of William & Mary; A.B., University of Nevada, 1949; J.D., Harvard, 1952.

1. See, e.g., COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY: THE SIXTH ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY 494 (1975) [hereinafter cited as SIXTH ANNUAL REPORT]:

The U.S. economy has been experiencing severe economic problems over the past few years. Inflation, unemployment, and capital scarcity have affected everyone. These difficulties have focused attention on the economic effects of government programs. Environmental programs in particular have come under close scrutiny in their effects on both jobs and prices. The changed economic climate makes it more important than ever to subject these programs to rigorous economic analysis.

Also see COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY: THE SEVENTH ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY 150 (1976) [hereinafter cited as SEVENTH ANNUAL REPORT]:

Concern about sufficiency of capital has grown during the last year. Will the economy be able to generate enough capital to make all the investments needed to satisfy our society's many goals—e.g., for a cleaner environment, energy self-sufficiency, more goods and services, and better housing?

See also COUNCIL OF ECONOMIC ADVISORS, ECONOMIC REPORT OF THE PRESIDENT 39-47 (1976).

2. See, e.g., U.S. ENVIRONMENTAL PROTECTION AGENCY, THE ECONOMICS OF CLEAN WATER (1973); NATIONAL COMMISSION ON WATER QUALITY, STAFF DRAFT REPORT (1975); *The Economic Impact of Environmental Regulations: Hearings Before the Joint Economic Comm., Cong. of the U.S.*, 93d Cong., 2d Sess. (1974); U.S. ENVIRONMENTAL PROTECTION AGENCY, THE COST OF CLEAN AIR, ANNUAL REPORT OF THE ADMINISTRATOR OF EPA TO THE CONGRESS IN COMPLIANCE WITH PUBLIC LAW 91-604, THE CLEAN AIR ACT, AS AMENDED (1974); ENERGY & ENVIRONMENT GROUP, OFFICE OF PLANNING & EVALUATION, ENVIRONMENTAL PROTECTION AGENCY, THE ECONOMIC IMPACT OF EPA'S AIR AND WATER REGULATIONS ON THE

As this analysis has become more sophisticated, environmental costs have been classified into four basic categories: damage costs, avoidance costs, abatement costs, and so-called "transaction" costs.³ Although official concern for pollution abatement costs dates from 1972,⁴ and although increasingly frequent studies of this problem have subsequently been undertaken,⁵ it has generally been recognized that this analysis is still in its infancy.⁶

Despite the difficulties of cost quantification and the recognition that forecast environmental costs are at best approximations, it seems clear that environmental costs will be a major factor affecting the national economy in the foreseeable future. Similarly, it is not feasible at this time to forecast with precision the capital investment that will be required by the private sector during the next decade and beyond to comply with existing federal environmental laws and regulations, and the various state and local requirements. The most recent comprehensive forecast was published by the Council on Environmental Quality (CEQ) in its 1976 Annual Re-

ELECTRIC UTILITY INDUSTRY, Vols. I-IV (1975); U.S. DEPARTMENT OF COMMERCE: THE EFFECTS OF POLLUTION ON INTERNATIONAL TRADE, Vol. I (1973), Vol. II (1974), Vol. III (1975).

3. COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY: THE FOURTH ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY 74 (1973). The CEQ was created by Title II of the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. §§ 4321-47 (1970), for the purpose *inter alia* of developing and recommending programs and policies to the President to foster and promote the improvement of environmental quality. For enumeration of the duties and functions of the CEQ, *see id.* § 204, 42 U.S.C. § 4344 (1970). Under the CEQ cost classification, damage costs include such items as blighted crops, ill health, corrosion of buildings and the like. Avoidance costs include buying an air or water filtration system or the cost of moving to an unimpacted area. Abatement costs include those resources expended to reduce or eliminate pollution including indirect costs arising from the impact of these expenditures on economic growth, productivity or employment. Transaction costs include the value of resources allocated to research, planning, monitoring and similar activities necessary for pollution abatement.

4. *See* the summary relating to cost classification in SIXTH ANNUAL REPORT, *supra* note 1, at 496-532.

5. *See* note 2 *supra*.

6. SIXTH ANNUAL REPORT 496-511. For an account of the methodological difficulties of environmental cost quantification, *see* Whitney, *The Trade Act of 1974: Coping with Unequal Environmental Control Costs*, 16 B.C. INDUS. & COM. L. REV. 577, 585-92 (1975). *See also* ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL NEWS, THE IMPACT OF ENVIRONMENTAL REGULATIONS ON CAPITAL MARKETS AND ON INDUSTRY CAPITAL-RAISING PROBLEMS 2 (1975) [hereinafter cited as EPA CAPITAL STUDY], in which it is candidly admitted that "EPA analysis of the impacts of capital requirements for pollution control has been quite limited so far and is limited by the state-of-the-art to only modest improvements."

port.⁷ The CEQ estimates incremental⁸ pollution control expenditures for the private sector alone during the period 1975-1984 will exceed \$300 billion, of which approximately \$275 billion will consist of capital investment and capital costs.⁹

This analysis considers legislative and regulatory options available to cope with future private sector capital requirements to meet both "conventional" and environmental needs. While by no means agreed as to the precise amount of these needs, virtually all studies indicate they will be immense and will place great strain on the national economy.¹⁰

Moreover, it must be recognized that these pollution abatement costs will tend to increase rather than decrease. The as yet unchecked force of inflation is of course one important factor contributing to this problem. More importantly, most existing statutory environmental abatement programs are structured in a way that progressively increases the stringency of environmental requirements and consequently their cost. For example, the incremental cost to achieve national secondary ambient air quality standards will undoubtedly significantly exceed the cost to achieve primary standards.¹¹ Furthermore, the law requires that once the

7. SEVENTH ANNUAL REPORT, *supra* note 1.

8. Incremental costs are expenditures necessitated by designated federal environmental legislation beyond those expenditures that would have been made absent the legislation. The designated legislation includes air, water, radiation, noise and solid waste. Estimates for land reclamation, strip mining, coastal zone planning, ocean dumping, oil spills, pesticides and other environmental categories are not included. Likewise, the cost of compliance with state and local environmental laws and regulations is not included.

9. SEVENTH ANNUAL REPORT, *supra* note 1, at 167, Table 1-37.

10. B. BOSWORTH, J.S. DUESENBERY, & A.S. CANON, CAPITAL NEEDS IN THE SEVENTIES (1975) (published by the Brookings Institution), the most optimistic study, concludes "[w]e can afford the future, but just barely." The Brookings forecasts are confined to the decade of the Seventies. The methodology of the Brookings forecasts excludes consideration of abatement costs for air pollution, radiation, solid waste, noise, land reclamation, strip mining, pesticides, coastal zone management and other categories including the cost of compliance with state and local programs. The New York Stock Exchange Study, probably the most pessimistic analysis, forecasts an overall capital gap of \$650 billion during the period 1974-1985. EPA CAPITAL STUDY, *supra* note 6, at 4. CEQ in its most recent analysis posed the question, "[w]ill the economy be able to generate enough capital to make all the investments needed to satisfy our society's many goals—e.g. for a cleaner environment, energy self-sufficiency, more goods and services, and better housing?" CEQ noted "the answer is probably no." SEVENTH ANNUAL REPORT, *supra* note 1, at 150.

11. National primary ambient air quality standards are standards the attainment and maintenance of which are requisite to protect the public health. National second-

national ambient air quality standards are attained, they must then be maintained. This maintenance will necessitate an indefinitely ongoing comprehensive nationwide air quality maintenance program.¹² Furthermore, compliance with the judicially enunciated goal of no significant deterioration of the air quality in regions with air cleaner than that required by secondary standards will likewise create increasing direct and indirect incremental costs.¹³

The same cost augmentation phenomenon is built into the Federal Water Pollution Control legislation, which likewise envisions implementation of progressively more stringent standards culminating in the goal of eliminating discharges of all pollutants by 1985.¹⁴ Like the clean air strategy, maintenance of water quality is required once the mandated goal is achieved. Here too, this maintenance will necessitate costly continued planning and regulatory strategies to accommodate the apparently inevitable national growth while yet adhering to the no discharge requirement.¹⁵

To date no environmental cost forecast methodology has evolved accurate indicia to measure this phenomenon of disproportionately increasing costs, but it is essential to consider this factor when considering what legislative, regulatory or other action is appropriate to devise effective capital formation and/or capital recovery strategies.

Before considering possible specific legal-legislative options for capital formation, two basic policy issues must be considered: first, whether it is appropriate for the federal government to assist the

dary ambient air quality standards are standards the attainment and maintenance of which are requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air. Clean Air Amendments of 1970, §§ 109(b)(1), (2), 42 U.S.C. §§ 1857c-4(b)(1), (2) (1970).

12. *Id.* § 110, 42 U.S.C. § 1857c-5 (1970).

13. *Sierra Club v. Ruckelshaus*, 344 F. Supp. 253 (D.D.C. 1972), *aff'd*, 412 U.S. 541 (1973) (no opinion). *See also* 39 Fed. Reg. 42510-17 (1974).

14. The Federal Water Pollution Control Act of 1972, 33 U.S.C. §§ 1251-1376 (Supp. V 1975), structures a progressively more stringent control program which requires by July 1, 1977, "the best practicable control technology currently available" and by July 1, 1983, "the best available technology economically achievable" which will result in "reasonable further progress" toward the elimination of all discharges of pollutants by 1985. *Id.* § 301(b), 33 U.S.C. § 1311(b) (Supp. V 1975).

15. *Id. See, e.g., id.* § 208, 33 U.S.C. § 1288 (Supp. V 1975) (areawide waste treatment management planning); *id.* § 209, 33 U.S.C. § 1289 (Supp. V 1975) (basin planning). Other examples of cost augmentation include the increasing cost of federal decision-making arising from judicially expanded NEPA requirements. Current aircraft noise abatement regulations pursuant to the Noise Control Act of 1972, 42 U.S.C. §§ 4901-4918 (Supp. V 1975), likewise involve increased incremental cost.

private sector to meet the costs of federally enacted environmental laws and regulations, and second, if it is determined that it is either necessary or desirable that the federal government assist private sector compliance, what form the assistance should take.

I. FEDERAL GOVERNMENTAL OPTIONS OR INTERNALIZATION OF ABATEMENT COSTS?²—A CRITICAL NATIONAL DECISION

For the private sector to be able to alter its plants and processes to comply with existing environmental laws and regulations it must develop the funds to pay for abatement. The CEQ correctly recognizes that these costs and capital needs are "incremental"; that is, expenditures are necessitated by the designated federal environmental legislation beyond those "business as usual" expenditures that would have been made absent the legislation.¹⁶ Consequently these incremental environmental requirements are *additional* to the so-called "conventional" capital requirements that are necessary to a growing and productive economy capable of assuring that the *other* vital national goals of adequate employment and containment of inflation are achieved. Given the forecast capital shortfall during the coming decade,¹⁷ there is a distinct likelihood that rival claims on existing capital supply by the productive sector of the economy versus legally mandated environmental reform may well increase the cost of capital to the point that expansion of productive capacity and economic growth may be retarded with adverse effects on employment and the ability to control inflation. The Environmental Protection Agency (EPA) notes that "this spectre is particularly troubling because of the experience of 18-30 months ago when capacity shortages in the basic materials-producing industries seemed to throttle economic growth and spur inflation with unemployment at very high levels."¹⁸

Consequently, the nation is faced with the reality that *additional* capital formation methods (beyond those necessary to meet "conventional" needs) must be devised if we are to achieve the multiple national goals of a healthy economy and a protected environment.

Two basic possibilities of forming the necessary capital exist: (1) some form of federal assistance (grants, subsidies, tax incentives or "tax expenditures" of various kinds), or (2) "internalization" of en-

16. See note 8 *supra*.

17. See note 10 *supra*.

18. EPA CAPITAL STUDY, *supra* note 6, at 3.

vironmental costs by inclusion of the environmental increment into the pricing of goods and services to the consumer.

The CEQ has considered the option of imposing effluent charges set at a sufficiently high level to compel extraction of most of the pollutant, with the effluent charge being passed on to the consumer in the form of higher prices.¹⁹ This option entails serious disadvantages. First, to "internalize" environmental costs of the magnitude involved by passing them to the consumer in the form of higher prices would aggravate the inflationary price spiral and create further stresses between labor and management. The environmental cost increment added to the price of goods and services would undoubtedly give rise to increased wage demands and the cost would in large part redound to industry in the form of higher labor costs. Moreover, imposition of effluent charges only indirectly addresses the critical problem of how to rid the environment of pollution. If a given plant simply pays the charge and continues to pollute then the pollution is not abated. If instead, the plant chooses to install appropriate abatement equipment and avoids the effluent charge the problem of how to obtain the capital to buy the abatement equipment remains unanswered.

An additional disadvantage of internalizing environmental costs is that to do so would further weaken the United States international trade position by further pricing United States goods out of competitive markets. The "distortions" arising from unequal environmental control costs incurred by the United States private sector vis-a-vis competitors from its eleven principal trading partners constitute a major national problem which Congress sought to address in the Trade Act of 1974.²⁰ Given the national commitment to contain inflation within acceptable limits, it is rather clear that the nation's pricing structure cannot be expected to absorb some 300 billion dollars of additional environmental costs.

Moreover, the CEQ concept envisions use of varying charge levels to achieve desired degrees of pollution abatement:

Since the costs of removing any given pollutant presumably will vary as between processes, products and plants, a requirement of the same proportionate reduction, or a reduction to the same absolute level, would impose high costs on some and rela-

19. REPORT OF THE TAX POLICY ADVISORY COMMITTEE TO THE COUNCIL ON ENVIRONMENTAL QUALITY 21 (1973) [hereinafter cited as TAX POLICY REPORT].

20. See Whitney, *The Trade Act of 1974: Coping with Unequal Environmental Control Costs*, 16 B.C. INDUS. & COM. L. REV. 577 (1975).

tively low costs on others. The same aggregate reduction in an area could be achieved by an effluent charge which will lead to substantial or very large proportionate reductions in pollution where that could be achieved relatively inexpensively, with little reduction where it was relatively more expensive to make improvements.²¹

To be effective, this system must produce a program of pollution abatement which results in compliance at any given time with statutory environmental standards. Coordination of a schedule of fees which might well vary from industry to industry and from plant to plant to produce pollution levels that comply with standards required by law would be extraordinarily difficult to determine accurately and costly to administer. Thus it would appear that "internalization" could not produce adequate net capital accretions and would create problems at least as troublesome as those it seeks to solve.

Finally, it seems clear that Congress by enacting the various environmental laws has elevated environmental protection to a major national policy not unlike public health (with which the environmental quality is closely related), law enforcement and national security. Consequently, whenever private sector compliance is either impossible as an economic matter, or is attainable only at the expense of major impacts on the national economy, it seems appropriate, in fact necessary, that public funds, whether in the form of so-called tax expenditures, in the form of tax incentives, or in the form of grants, guaranteed loans or subsidies, be used to achieve the national goal of environmental protection. Congress has repeatedly recognized this principle in its appropriation of grants for, *inter alia*, publicly owned treatment works, environmental planning, research and development, and monitoring systems.

II. ASSUMING FEDERAL FISCAL ACTION, WHAT FORM SHOULD IT TAKE?

Given the determination that federal fiscal action is preferable to "internalization" of environmental costs in the price structure, the *form* this federal action should take is controversial. Leaving out of account certain tax incentives devised to influence conduct that

21. TAX POLICY REPORT, *supra* note 19, at 21.

tends to have beneficial environmental consequences,²² Professor Stanley Surrey²³ has identified two basic federal options:

1. "Direct government expenditure programs," a process under which programs are normally given direct and searching budget management evaluation (this would include grants, subsidies and loan guarantees).²⁴

2. "Tax subsidies" or "tax expenditures," a process by which some program or project is financed by tax liability concessions of one kind or another (this would include investment tax credits, accelerated depreciation and tax exemption).²⁵

Professor Surrey opposes "tax expenditures" because they "tumble into the law without supporting studies, being propelled instead by cliches, debating points, and scraps of data and tables that are passed off as serious evidence."²⁶ Apart from this rhetoric, it appears that Professor Surrey's *substantive* objections to use of the "tax expenditure" option are:

- (1) That the need for programs supported by tax expenditures receives inadequate or at least less consideration than the need for direct expenditure programs;
- (2) That the costs and benefits of a program are given less or inadequate consideration when tax expenditures are employed;
- (3) That program effectiveness evaluation is less likely to occur when programs are supported by tax expenditures;
- (4) That program objectives of tax expenditure programs are more apt to be obscure.²⁷

Professor Surrey advocates that the antidote to ill-considered programs supported by tax expenditures is to "restate the tax program as a direct expenditure program and ask whether such a pro-

22. See, e.g., S. REP. NO. 938, 94th Cong., 2d Sess. 24 (1976), which lists various energy related activities for which Congress through special tax provisions provides incentives to develop environmentally beneficial programs.

23. Professor Surrey is Professor of Taxation at the Harvard Law School and has served as Assistant Secretary of the Treasury for Tax Policy.

24. *Hearings on Tax Subsidies as a Device for Implementing Government Policy: A Comparison with Direct Government Expenditure Before the Subcomm. on Priorities and Economy in Government of the Joint Economic Comm.*, 92d Cong., 1st Sess. 48-59 (1972) (statement of Stanley S. Surrey).

25. *Id.*

26. *Id.*

27. *Id.*

gram represents a desirable policy.²⁸ But even if the program when "directly" evaluated turns out to be a "desirable policy," Professor Surrey still believes that support of the program should be in the form of a direct expenditure program:

Thus, for example, if it is decided that elimination of tax expenditures for natural resources should be accompanied by government assistance in oil and mineral exploration, the direct programs can be readily devised.²⁹

Whether some, many or all tax expenditure programs in fact "tumble into the law" without the four-fold program evaluation Professor Surrey advocates is a question that need not be resolved herein. It is elementary good government that all programs should receive such evaluation regardless of what funding process is utilized. In the ensuing portions of this analysis devoted to consideration of the various capital formation and/or recovery options available through tax legislation such direct program evaluation will in fact be undertaken. Such direct evaluation demonstrates that adoption of improved investment tax credit measures, a special environmental investment tax credit system, and improved capital recovery measures are all essential to achieve the multiple national goals of a sound economy and environmental protection.

The fundamental dispute arises over the proposition that tax expenditure programs should or must be "translated" into direct government expenditure programs to be effective and accountable.

One of the primary realities that must be recognized is that the investment tax credit and the special environmental credit are not "tax subsidies." As shown hereinafter,³⁰ *neither* will produce any revenue dilution but rather, based on some fifteen years' experience, will *stimulate* treasury receipts due to the increased production of pollution abatement devices which thereby increases the private sector taxable basis.

In contrast, given the presence of perennial budget deficits, to address capital formation problems by direct grants would aggravate the federal deficit picture and necessitate further federal borrowing to obtain grant funds that would otherwise be available through tax credits without incurring interest charges. Thus a direct expenditure approach to the capital formation problem would

28. *Id.*

29. *Id.*

30. See notes 34-36 and accompanying text *infra*.

be more costly in absolute numbers of dollars and would contribute to increasing the national deficit. Moreover, the various investment tax credit provisions are virtually self-administering, thereby obviating the cost of additional grant administration personnel.

The importance of the foregoing is underscored by the fact that the federal government is already heavily involved in direct environmental grant programs that are increasing rapidly: \$5.9 billion in 1975, \$7.1 billion in 1976 (estimated) and \$8.6 billion in 1977 (estimated).³¹ Moreover, the federal government also expends substantial amounts to assist state and local governments in bearing their share of environmental abatement costs and programs. CEQ forecasts that the federal government will subsidize state and local governments by more than \$3 billion between 1975 and 1983 quite apart from the above-noted grants.³²

III. CAPITAL FORMATION BY TAX LEGISLATION

A. *The Investment Tax Credit*

During the period 1962 through 1975, the various investment tax credit measures have provided an important source of capital for American industry. Experimentation with the investment credit during this period has demonstrated that it is a particularly effective means of controlling the level of capital supply thereby significantly affecting productivity, employment levels, and the rate of inflation.³³ Moreover, use of the investment credit can be made without incurring dilution of Treasury revenues.³⁴ The increased productivity resulting from investment credit expenditures increases the corporate income base and thus produces corporate tax revenues to the Treasury which substantially exceed revenue dilution. This factor was implicitly recognized by the Congress in its recent enactment of the Tax Reform Act of 1976³⁵ which extended the existing investment credit until December 31, 1980 (which would otherwise have expired December 31, 1976).³⁶ In addition, there

31. SEVENTH ANNUAL REPORT, *supra* note 1, at 349.

32. *Id.* at 151.

33. See R.H. GORDON & D.W. JORGENSON, POLICY ALTERNATIVES FOR THE INVESTMENT TAX CREDIT 13 (1975) [hereinafter cited as POLICY ALTERNATIVES STUDY].

34. INTERNAL REVENUE SERVICE, U.S. DEP'T OF TREASURY, TAX REVENUE STATISTICS (1961-1975).

35. Pub. L. No. 94-455, 90 Stat. 1520 (1976).

36. Tax Reduction Act of 1975, § 301(a)(1), 26 U.S.C. § 46(a)(1) (Supp. V 1975),

is a long-lasting continued increase in budget revenues as a result of the investment tax credit.

While a four year extension constitutes some progress, it is evident that *indefinite* extension of investment credit provisions is a minimum essential merely to accommodate *existing non-environmental* capital needs. Former Secretary of the Treasury Simon recently stressed the serious effects of corporate borrowing, which has sharply increased during the past decade as internally generated corporate funds and equity financing fell short of meeting capital needs.

One of the factors which can inhibit the future growth of needed capital formation is the financial condition of American corporations. Analysis of debt-equity ratios indicates that corporate balance sheets have shown signs of deterioration over the past decade, which is a break from the pattern which persisted in earlier periods. Debt has increased dramatically, both in absolute terms and relative assets and income. Interest costs have risen appreciably, roughly doubling over the past ten years. The combination of increased debt financing and higher interest rates has resulted in a decline in the coverage ratios reported by American corporations—that is, the ratio of earnings to interest charges. The ratio of liquid assets to debt has shrunk. As a result of these developments, there is a serious question about the potential capability of companies to be able to finance the capital investment that will be required to achieve our basic economic goals of reducing unemployment and inflation as I outlined earlier in my testimony.³⁷

The investment credit device offers significant advantages. First, the taxpayer is entitled to the credit *only* when the proceeds are in fact used for the designated statutory purpose thereby assuring that the purpose of the credit is achieved. It thus possesses the advantage of being for all practical purposes self-administering, unlike direct government expenditure programs.

Second, the investment credit is a highly effective means of “capital deepening” and can, over the years, contribute significant-

amended by Tax Reform Act of 1976, Pub. L. No. 94-455, § 802(a), 90 Stat. 1580. See H. CONF. REP. NO. 1515, 94th Cong., 2d Sess. 443 (1976). The Tax Reduction Act of 1975 had increased the prior level from seven percent (four percent for certain utility property) for qualified investments to ten percent. Tax Reduction Act of 1975, § 301, 26 U.S.C. § 46 (Supp. V 1975).

37. *Tax Reform Act of 1976: Hearings on H.R. 10612 Before the Senate Comm. on Finance*, 94th Cong., 2d Sess. 2367 (1976) (statement of William Simon, then Secretary of the Treasury).

ly to the capital base of the economy that will be necessary for increased productivity and employment, and containment of inflation to an acceptable rate. To achieve these goals the investment credit must be both adequate in amount and of sufficiently long duration.

As to the amount, Congress in its wisdom in the Tax Reform Act determined that 10 percent was appropriate during the period through December 31, 1980. Yet virtually every responsible economic forecaster predicts that the "capital gap" will increase during the next decade and probably for the remainder of the century.³⁸ It would have been more consonant with economic realities had Congress followed the Senate bill³⁹ and enacted an investment credit provision of indefinite duration. Moreover, such investment credit should be structured to increase in amount from the basic irreducible 10 percent to higher rates which would generate increasing capital necessary to maintain acceptable levels of productivity and employment. By such a system the amount of investment credit could be adjusted to keep pace with capital requirements without resort to the time-consuming process of enacting new tax legislation periodically, and in addition the long term continuity that is essential would thereby be provided. Experience with the Tax Reduction Act of 1975 demonstrates that due to long lead times in obtaining heavy equipment, there must be a long term investment credit program if companies are to utilize the credit effectively.

The Tax Reform Act of 1976 contains other important provisions that facilitate capital formation. Congress modified the prior limitation of the investment credit to \$25,000 of tax liability plus 50 percent of liability in excess of \$25,000⁴⁰ and provided a three year carry-back and a seven year carry-forward for credits not used due to the above-noted limitations.⁴¹ Under this system, credits accruing in a given taxable year are applied against the tax liability for that year before any carry-overs or carry-backs of unused credits from other taxable years become applicable.

In addition, under the 1976 Act a so-called "first-in first-out" method of handling investment credits was adopted. Thus in a

38. See note 10 *supra*.

39. See S. REP. NO. 94-938, 94th Cong., 2d Sess., pt. 1 at 17-18 (1976).

40. Tax Reform Act of 1976, Pub. L. No. 94-455, § 802(a)(2), 90 Stat. 1581, amending 26 U.S.C. § 46 (1970), as amended (Supp. V 1975).

41. Tax Reform Act of 1976, Pub. L. No. 94-455, § 802(b)(2), 90 Stat. 1582. A ten year carry-forward is available for unused pre-1971 credits.

given taxable year the *oldest* pending credit is used first, the next oldest next, and so on.⁴² The effect of this provision is to enhance the likelihood that credits will be fully utilized by effectively extending the duration of credit eligibility. Lengthening the potential duration of earned credits likewise increases somewhat the possibility that unprofitable or marginally profitable companies may utilize such credits.

B. *Environmental Investment Tax Credit*

Prior to enactment of the Tax Reform Act of 1976, federal tax provisions provided little in the way of "tax expenditures" to meet pollution control capital requirements. One such provision provides that the interest earned on industrial development bonds shall not be included in the gross income of the bondholder if he either qualifies as an "exempt person" (*i.e.*, an Internal Revenue Code Section 501(c)(3) entity exempt from tax under Section 501(a)) or if substantially all of the proceeds of the bond are used, *inter alia*, (A) for sewer or solid waste disposal facilities, or (B) for air or water pollution control facilities.⁴³ However, provision (A) may well (among other disadvantages and limitations) actually encourage waste disposal rather than recycling; and as to air and water pollution control facilities, most if not all bond proceeds would inure to the benefit of state or local governments rather than meeting private sector needs.⁴⁴

The other "environmental" provision prior to passage of the 1976 Act allows "every person" to elect five year amortization for "any certified pollution control facility" which is "a new identifiable treatment facility which is used, in connection with a plant or other property in operation . . . to abate or control water or atmospheric pollution or contamination by removing, altering, disposing, or storing of pollutants, contaminants, wastes or heat" if both the

42. *Id.* § 802(a), 90 Stat. 1580.

43. I.R.C. § 103(c).

44. One article forecast that during the period 1973-1980 approximately 25 percent of an estimated capital requirement of \$26 billion might be derived by industrial development bonds. *BUS. WEEK*, July 29, 1972, at 51. Whatever may be said of the accuracy of these forecasts it is clear that such funds as are derived will not be available to meet or provide a substitute for private sector capital needs. A minor possible exception would be a situation in which a private corporation purchased either a recycling facility or an air or water pollution facility (both would have to be available for general public use) and under I.R.C. § 48(h)(12) obtained an investment credit and took depreciation under either section 167 or 169. Such situations must be rare if they occur at all.

state and federal "certifying authorities" approve.⁴⁵ By virtue of the definition of "new identifiable treatment facility" this five year amortization can be elected only as to "tangible property" (not including a building and its structural components, other than a building which is exclusively a treatment facility) which is of a character subject to the allowance for depreciation provided in section 167 "but only if the construction is completed after December 31, 1968 and placed in service before January 1, 1976."⁴⁶ The amortizable basis of such a facility was not eligible for the investment credit.⁴⁷

The 1976 Act provides for two significant improvements:

1. As to qualifying facilities constructed after January 1, 1969, but before January 1, 1976, the taxpayer can elect a five year amortization plan *and* take one-half the investment credit provided the investment did not lead "to a significant increase in output or capacity, a significant extension of useful life, or a significant reduction in total operating costs for such plant or other property (or any unit thereof), or a significant alteration in the nature of a manufacturing production process or facility."⁴⁸

2. As to qualifying facilities placed in service after December 31, 1976, the taxpayer can elect *both* a five year amortization schedule *and* an investment credit not to exceed two-thirds of the 10 percent standard investment credit.⁴⁹

Adoption of the principle of a special environmental investment credit by the Congress is of the utmost importance. As already noted⁵⁰ it is highly doubtful the capital formation produced by the

45. I.R.C. § 169.

46. *Id.*

47. H.R. REP. NO. 1515, 94th Cong., 2d Sess. 498 (1976).

48. *Id.* "Significant" was deemed by the Conferees to mean a change of more than five percent, a standard applied to the operating unit most directly associated with the pollution control facility.

49. *Id.* at 498-99. To achieve maximum capital formation it is essential that investment credit provisions and depreciation rates be coordinated rather than working against each other. When the tax credit was first implemented in 1962, the so-called Long amendment subtracted credit claims from the basis used to calculate depreciation schedules. The effect was to dilute total capital recovered and was thereby counterproductive to the objective of maximizing capital supply. The provision was deleted in 1964 in part because it substantially complicated calculation of depreciation writeoffs. Apart from administrative complications, the subtraction of credits from basis is essentially self-defeating. It must be recognized that any constraint on achieving total available investment credits runs counter to basic capital formation goals and should be avoided.

50. See note 44 and accompanying text *supra*.

standard investment credit provision of section 802 will be sufficient to meet future needs and, as suggested above, should be keyed flexibly to increasing capital requirements. Without special provision for an environmental investment credit to meet capital requirements created by private sector compliance with federal environmental laws and regulations, an unhealthy competition for capital would arise which would both impede productivity and related employment and thwart or delay unduly compliance with national environmental objectives. In this latter connection it should be stressed that a number of environmental statutes condition compliance and attainment of standards upon economic practicability.⁵¹ Hence congressional recognition of the need for special environmental investment credits is of landmark significance.

It should be further noted that were Congress to adopt the "sliding scale" approach to the regular investment credit, as advocated, the special environmental credit for qualifying facilities placed in service after December 31, 1976, which amounts to two-thirds of the regular credit would likewise escalate when the regular credit escalated to meet increased capital needs.

Although Congress in the 1976 Act expanded somewhat the definitional scope for qualifying facilities, it still remains unduly circumscribed. The credit should be available not only for pollution abatement equipment and buildings that are entirely pollution abatement facilities, but for other buildings and structures as well. The credit should extend to environmentally designed production facilities and processes as well if reform objectives are to be realized. In future years when the national air and water quality goals have, hopefully, been reached, then the predominant regulatory objective will be the maintenance of these standards. Necessarily, with anticipated growth in population and industrial activity, air and water quality maintenance objectives will be feasible only by fundamental redesign of many plants and processes. Extension of investment credits for plants would provide a needed stimulus to phase out existing operations which are costly and not optimally feasible to modify, and to replace these with environmentally designed plants better capable of achieving future standards at acceptable maintenance and operation cost levels. It is

51. See, e.g., note 14 *supra*. The Noise Control Act of 1972, 42 U.S.C. §§ 4901-4918 (Supp. V 1975), and the Clean Air Amendments of 1970, 42 U.S.C. §§ 1857-1857l (1970), also contain economic conditions.

widely recognized that the incremental cost of achieving higher levels of environmental purity mounts steeply as stricter goals are met and maintained.⁵² In the long run it will thus be cheaper to convert to plants and processes which have been designed to achieve a high degree of environmental protection rather than continue to "fix," or modify or retrofit, existing plants to meet and maintain increasingly stricter standards.

To be fully effective, tax incentives should be available for *any* control facility or abatement procedure required by federal, state or local environmental laws or regulations. Accordingly, existing law should be amended to include a broad tax incentive definition, such as:

The term "pollution control facility" means any facility (including buildings and equipment) the primary purpose of which is to abate, control or prevent actual or potential environmental pollution.

While air and water pollution control at present appears to comprise the major portion of forecast environmental cost, Congress has enacted extensive legislation addressed to other kinds of pollution.⁵³ Abatement strategies for stripmining, solid waste, pesticides, oil spills, ocean dumping and other categories are in their infancy. As regulatory programs in these areas are developed, significant additional costs will undoubtedly result. Congress, therefore, should provide for comprehensive environmental tax incentives keyed to the full range of environmental protection and reform programs that it has enacted.

While there has as yet been no actual experience with implementation of the environmental tax credit, available data suggests it will offer all the same advantages that the conventional credit provides. Like the conventional credit, the environmental credit program is self-administering and avoids the cost of grant administration personnel. Furthermore, recent CEQ economic studies conclude that funds spent on environmental abatement will not only significantly enhance the productivity of existing firms that manufacture or build abatement equipment and facilities but will attract new private sector activity as well.⁵⁴

52. See TAX POLICY REPORT, *supra* note 19, at 20.

53. See note 8 *supra*.

54. COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL TAX PROGRAM AND EMPLOYMENT 1 (1975): "Environmental programs are stimulating construction,

While these CEQ studies do not undertake to quantify the amount by which Treasury tax receipts are increased by the new economic activity stimulated by the "environmental industry," CEQ does estimate "that approximately 300,000 people are now employed who would not otherwise be."⁵⁵ CEQ adopted a rule-of-thumb indicator that a billion dollar expenditure generates directly or indirectly about 70,000 jobs.⁵⁶ Thus given the expenditure of the forecast private sector environmental capital requirements during the period 1975-1984,⁵⁷ it is evident that the federal tax base will be expanded enormously, and such expansion will increase the Treasury tax revenue yields as well. Thus there is every reason to conclude that the revenue yield history of the conventional investment credit will also hold true for the environmental tax credit.

Moreover, since it is virtually universally conceded that a protracted period of capital shortage will prevail, it is evident that without the environmental tax credit, every investment dollar diverted from "conventional" production activity to meet legally mandated environmental requirements will thereby increase the expected capital gap and so contribute to less productivity, lower employment and, correspondingly, less tax revenues.

Finally, to the extent that the special environmental credit contributes to the ability of United States industry to compete effectively costwise with our eleven leading trade partners, the credit will contribute to solution of the "distortion" problem arising from unequal United States versus foreign environmental costs without recourse to import relief measures.⁵⁸

equipment, and research expenditures that would not otherwise be undertaken." *See also*, COUNCIL ON ENVIRONMENTAL QUALITY, POLLUTION CONTROL AND EMPLOYMENT 8 (1976):

In brief then, pollution control expenditures are seen as having a net positive impact on employment at the present time. And a new industry has been established which has been a source of growing employment during the past few years. This industry has the opportunity and challenge to devise innovative abatement systems which will conserve natural resources, save energy, and reduce costs. If it is successful in meeting this challenge, this industry will not only provide a source of continuing employment itself, but will help contribute to the continued viability and stability of our whole economy.

55. COUNCIL ON ENVIRONMENTAL QUALITY, POLLUTION CONTROL AND EMPLOYMENT 8 (1976).

56. *Id.* at 7.

57. *See* note 10 and accompanying text *supra*.

58. *See* note 20 and accompanying text *supra*.

C. *Accelerated Capital Recovery*

As with investment credits, United States policy with respect to capital recovery provisions must take into account both the so-called conventional needs of the economy to achieve increased productivity and employment and the special demands resulting from environmental pollution abatement. Despite the recent upturn in the United States economy, certain basic long-term indicators suggest that major increases in investment will be necessary to restore its vitality. The United States has lagged significantly behind other industrialized nations in terms of productivity growth during the period 1960-1973.⁵⁹ This trend is particularly ominous because in the past the United States has been able to preserve viable market shares against foreign competition despite price disadvantages by virtue of superior worker productivity.⁶⁰

A similarly bleak trend is evident in the comparative real gross national products (GNP) per employed civilian of several nations during the period 1950-1972. The declining worker productivity in the United States has produced a condition in which the GNP per worker in the United States has fallen below that enjoyed by such nations with troubled economies as Great Britain, France and Italy. Given the well-established relationship between the level of investment and growth, it is clear that expanded capital recovery provisions are necessary to augment capital supply and production investment to counter these trends. It is no coincidence that virtually all of the industrialized nations have more liberal capital recovery provisions than those presently in force in the United States under the Asset Depreciation Range (ADR) System.⁶¹ These facts suggest the immediate need to increase the permissible range under the ADR System for depreciating capital assets from 20 percent to a significantly higher level.

A further important corrective measure would be the elimination of the salvage increment in depreciation schedules. During periods of inflation, depreciation allowances based on original cost fail to recover capital adequate to finance facilities having significantly higher replacement costs. Moreover, during such inflationary periods corporate profits, unless adjusted for inflation, are over-

59. INTERNAL REVENUE SERVICE, U.S. DEP'T OF TREASURY, TAX REVENUE STATISTICS (1961-1975).

60. U.S. DEP'T OF LABOR, BUREAU OF LABOR STATISTICS (1960-1973).

61. Treas. Reg. § 1.167(a)-11 (1971).

stated. It has heretofore been noted⁶² that the inability to generate sufficient capital from corporate profits has weakened the economy by creating increasing dependence on debt financing with resultant deterioration of debt-equity ratios. This shortfall in capital recovery during a period of higher replacement costs and declining profits is aggravated by inclusion of a salvage factor in depreciation schedules. It must be recognized that the salvage increment is a holdover from the archaic policy of gearing depreciation schedules to the actual life of assets. Retention of such anomalies in the tax law impedes attainment of adequate capital supplies and is thus counterproductive.

Given the magnitude of capital requirements to increase productivity and employment, the additional drain on capital funds created by environmental requirements mandates special treatment. Pollution control costs have increased and are forecast to continue to increase dramatically. The CEQ study notes that expenditures for pollution control totalled \$12.3 billion for capital expenditures in 1974, and that these are forecast to reach \$27.5 billion for operating and maintenance and \$27.8 billion for capital expenditures in 1983.⁶³ In view of the increasingly high incremental cost of attaining progressively stricter goals that are structured into major existing environmental laws, these estimates may indeed be low.

IV. CONCLUSION

For at least the remainder of this century the United States faces uniquely complex and difficult challenges. It must cope with already well-established trends of declining productivity, inflation and unemployment. To do so, adequate domestic energy resources must be developed at economically viable levels and industrial productivity must be expanded. Both goals also involve major impacts on the environment which will be increasingly costly to control within acceptable limits. What constitutes acceptable limits has been defined by Congress in terms of legal deadlines established by comprehensive legislative and regulatory programs. These programs were structured by Congress to impose progressively more stringent standards which will become increasingly costly to achieve. Moreover, environmental control programs are likely to

62. See note 37 and accompanying text *supra*.

63. SIXTH ANNUAL REPORT, *supra* note 1, at 564.

expand—*e.g.*, to protect more effectively ocean, outer continental shelf and coastal resources. Significant additional effort will be required in the areas of research, planning and environmental design.

All of these efforts must be undertaken and implemented contemporaneously. Consequently, the government must devise capital formation and recovery provisions capable of financing *all* of these deeply interrelated activities. At a minimum the following program appears to be indispensable:

1. Continuation on an indefinite basis of existing investment credit provisions amended to provide sliding scale adjustments to reflect changes in capital requirements.

2. Adoption of the perfecting amendments to existing investment credit provisions.

3. Continuation of the special investment credit for environmental control expenditures keyed to the level of the standard investment credit as adjusted by the sliding scale procedure.

4. Reform of existing capital recovery provisions for non-environmental investment.

5. Expensing in the year invested rather than depreciating facilities installed pursuant to environmental requirements.

Anything short of this multi-dimensional program will seriously jeopardize the prospects for attaining one or more indispensable national goals. With the exception of certain suggested improvements the validity of all of the foregoing has been recognized in principle by the Congress in the Tax Reform Act of 1976. These measures have in fact been carefully scrutinized, their costs and benefits weighed, and the ultimate program objectives considered. Important improvements and refinements remain to be made but it is clear that the tax legislative approach is a far sounder method of coping with capital formation requirements and offers many more advantages than the direct government expenditure alternative.