

**ENVIRONMENTAL PROTECTION AGENCY**

[FRL-5629-9]

**Calculation of the Economic Benefit of Noncompliance in EPA's Civil Penalty Enforcement Cases**

AGENCY: Environmental Protection Agency (EPA).

ACTION: Request for comment.

**SUMMARY:** The Environmental Protection Agency ("EPA") requests comment on how it calculates the economic benefit obtained by regulated entities as a result of violating environmental requirements. In particular, the Agency is seeking comment on three categories of issues: The most effective mechanism for recapturing economic benefit; the methodology and assumptions incorporated in the economic benefit ("BEN") computer model used by the Agency to calculate that benefit; and the model's precision and user-friendliness. After the comment period closes, the Agency plans to review all the comments and revise its benefit recapture approach as appropriate.

**DATES:** EPA urges interested parties to comment in writing on the BEN model and the EPA's benefit recapture approach. Comments must be received by EPA at the address below by January 1, 1997. Comments may also be communicated verbally at two public meetings EPA will hold during the comment period. The first one is scheduled for Washington, DC in the auditorium at EPA's Education Center at 401 M Street, SW., on November 6, 1996. The second one is scheduled for San Francisco at the Holiday Inn Golden Gateway at 1500 Van Ness Ave on November 13. Both meetings will begin at 9:30 a.m. and end at 4:00 p.m.

**ADDRESSES:** Written comments should be submitted in triplicate to: U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance, Economic Benefit Docket Clerk, Mail Code 2248-A, 401 M Street, SW., Washington, DC 20460, and reference this docket.

EPA will maintain a record of all written comments submitted pursuant to this notice. Copies of the comments may be reviewed at the Ariel Rios Federal Building, 1200 Pennsylvania Avenue, Washington, DC 20044. Persons interested in reviewing the comments must make advance arrangements to do so by calling (202) 564-2235.

**FOR FURTHER INFORMATION CONTACT:**

Copies of the BEN computer model and the BEN Users Manual may be obtained

from the National Technological Information Service by calling (703) 487-4650. Callers should request order number PB95-502514INC. Electronic copies of these items are also downloadable through the Office of Enforcement and Compliance Assurance's communications network called "EnviroSenSe." EnviroSenSe is a free public network accessible via the World Wide Web on the Internet (<http://es.inel.gov>), and via an electronic Bulletin Board System ([703] 908-2092). For further information, contact Jonathan Libber, Office of Regulatory Enforcement, Multimedia Enforcement Division, at (202) 564-6011.

**SUPPLEMENTARY INFORMATION:****I. Introduction****A. Overview**

One of the Environmental Protection Agency's most important responsibilities is ensuring compliance with the federal environmental laws. These laws, and their implementing regulations, set minimum standards for protecting human health and welfare and achieving environmental protection goals, such as clean air and clean water. EPA upholds these laws through vigorous enforcement actions that correct the violations and appropriately penalize violators.

A cornerstone of the EPA's civil penalty program is recapture of the economic benefit that a violator may have gained from illegal activity, whenever EPA can effectively measure that gain. Recapture helps level the economic playing field, preventing violators from obtaining an unfair financial advantage over their competitors who timely made the necessary investment in environmental compliance. Generically, penalties serve as incentives to protection of the environment and public health by encouraging the adoption of pollution prevention and recycling practices that limit exposure to liability for pollutant discharges. Finally, appropriate penalties help deter future violations by the violator and by others similarly situated.

EPA has promulgated a generic civil penalty policy, as well as specific penalty policies tailored to suit the needs of particular programs. For example, there is a civil penalty policy specifically designed to address violations of the Clean Water Act. Civil penalties imposed by EPA usually have two components: gravity and economic benefit. The gravity component reflects the seriousness of the violation and is generally determined through the

application of the appropriate EPA civil penalty policy.

The economic benefit component focusses on the violator's economic gain from noncompliance, which may occur in three basic ways. It can: (1) Delay necessary pollution control expenditures; (2) avoid necessary pollution control expenditures; or (3) gain an illegal competitive advantage during the period of noncompliance. This advantage may occur, for example, if a company sells banned products, or captures an extra market share through selling its products at a lower cost than its complying competitors.

The Agency designed the BEN computer model, for settlement purposes only, to calculate the economic benefit from these first two types of economic gain. The Agency does not have a standard methodology for calculating the benefit gained from an illegal competitive advantage, which is considered on a case-by-case basis.

**B. EPA Policy and Guidance on Recapturing the Economic Benefit of Noncompliance**

Since its development in 1984, the BEN computer model has been extensively used by EPA staff in generating penalty figures for settlement purposes that reflect the economic benefit a violator derived from delaying or avoiding compliance with environmental statutes.

**1. Policy Background**

Calculating a violator's economic benefit using the BEN computer model is usually the first step in developing a civil penalty figure under the Agency's *Policy on Civil Penalties* (PT.1-1) February 16, 1984, and *A Framework for Statute-Specific Approaches to Penalty Assessments* (PT.1-2) February 16, 1984 (hereinafter the "Framework"). The Agency developed the BEN computer model to assist in fulfilling one of the main goals of the *Policy on Civil Penalties*: recovery, at a minimum, the economic benefit from noncompliance.

The BEN computer model is intended to be used in calculating economic benefit for purposes of developing a *settlement* penalty, not for use at trial or in an administrative hearing. In presenting economic benefit testimony at trial or in an administrative hearing, the Agency typically relies on an expert to provide an independent financial analysis of the economic benefit the violator obtained as a result of its violations. This independent financial assessment reflects the expert's analytical approach as applied to the particular facts of that case. Although such an analysis is usually consistent

with the principles of the BEN model, it may not be identical to that set forth in the *BEN User's Manual*.

## 2. BEN Calculates the Economic Benefit From Delayed and Avoided Pollution Control Expenditures

The BEN model is designed to calculate two types of economic benefits: those gained from *delaying* and from *avoiding* required environmental expenditures. Delayed costs can include capital investments in pollution control equipment, delayed costs to remediate environmental damages caused (*e.g.*, remove unpermitted dredged or fill material and restore wetlands), or one-time expenditures required to comply with environmental regulations (*e.g.*, the cost of setting up a reporting system, or land purchases). Avoided costs include operation and maintenance costs and/or

other recurring costs (*e.g.*, off-site disposal of fluids from injection wells). BEN does not calculate a third type of benefits: those derived from a competitive advantage gained by a violator.

## 3. Current Model Usage and Applicability

The BEN model can be used in all cases where there is a measurable benefit from delaying or avoiding compliance, except for Clean Air Act Section 120 enforcement actions. (Section 120 requires the application of a specific computer model.) BEN was designed to be easy to use for people with little or no background in economics, financial analysis, or computers. Because the program contains standard values for many of the variables needed to calculate the

economic benefit, BEN can be run with only a small number of inputs from the user. The program also allows the user to replace those standard values with user-specific information. Table 1 lists the inputs to the BEN model. The optional inputs listed in Table 1 are those for which the model has standard values.

The model can estimate economic benefit for many types of organizations: corporations, partnerships, sole proprietorships, not-for-profit organizations and municipalities. The BEN model has two sets of standard values: one applies to for-profit business violators and the other applies to not-for-profit organizations. The BEN inputs listed in Table 1 are discussed in detail in Chapter 4 of the *BEN Users Manual* for both for-profit and not-for-profit organizations.

TABLE 1.—INPUTS FOR BEN

### Required Inputs:

- (1) Case Name, Profit Status, and Filing Status.
- (2) Capital Investment.
- (3) One-Time Nondepreciable Expenditure.
- (4) Annual Expenses.
- (5) Date of Noncompliance.
- (6) Date of Compliance.
- (7) Date of Penalty Payment.

### Optional Inputs (Standard Values that May be Modified):

- (8) Useful Life of Pollution Control Equipment.
- (9) Marginal Income Tax Rate for 1986 and Before.
- (10) Marginal Income Tax Rate for 1987 to 1992.
- (11) Marginal Income Tax Rate for 1993 and Beyond.
- (12) Inflation Rate.
- (13) Discount Rate.

### C. How a Firm Obtains an Economic Benefit From Delaying or Avoiding Compliance Costs

An organization's decision to comply with environmental regulations usually implies a commitment of financial resources, both initially (in the form of a capital investment or one-time expenditure) and over time (in the form of annual, continuing expenses). These expenditures should result in better protection of public health or environmental quality; however, they are unlikely to yield any direct economic benefit (*i.e.*, net gain) to the organization. If these financial resources were not used for compliance, they presumably are invested in projects with an expected direct economic benefit to the organization. This concept of alternative investment—that is, the amount the violator would normally expect to make by not investing in pollution control—is the basis for calculating the economic benefit of noncompliance.

As part of the Civil Penalty Policy, the Agency uses its penalty authority to remove or neutralize the economic incentive to violate environmental regulations. In the absence of enforcement and appropriate penalties, an organization's best economic interest will usually be to delay the commitment of funds for compliance with environmental regulations and to avoid certain other associated costs, such as operation and maintenance expenses.

#### 1. The Components of Economic Benefit Measured by the BEN Model

A violator may gain economic benefit from either delayed or avoided compliance costs. By delaying compliance, the violator can earn a return on the delayed capital or one-time costs of pollution control equipment. In other words, violators have the opportunity to invest their funds in projects other than those required to comply with environmental regulations. These other investments are ordinarily expected to yield a monetary

return at the violator's marginal rate of return on capital. But environmental expenditures typically yield no direct economic benefit. Thus, by delaying compliance, the violator benefits by the amount of earnings that could be expected from alternative investments.

A violator can also gain an economic benefit from avoiding pollution control expenditures. Avoided expenditures typically include the annual continuing expenses that a violator would have incurred if the facility had complied with environmental regulations on time, such as the costs of labor, raw materials, energy, lease payments and any other expenditures directly associated with the operation and maintenance of the pollution control equipment. Unlike capital and one-time expenditures which are only postponed, annual expenditures are avoided altogether. The resulting benefits to the violator are the total avoided annual costs as well as the return that could be expected on these avoided costs.

## 2. Taking Indirect Costs Into Account

EPA's BEN model evaluates economic benefit in terms of the effect that delayed or avoided pollution control expenditures have on an entity's cash flows. Cash flow analysis is a standard and accepted technique for evaluating costs and investments. In essence, the result of cash flow calculations is to determine the actual dollar costs and revenue resulting from an expenditure. Thus, noncash expenditures, such as depreciation, are only considered to the extent that they affect cash income or expenses. The three factors the model accounts for here are tax, inflation and discounting.

### a. After-Tax Cash Flows

The BEN model computes economic benefit in after-tax terms to take into account certain financial impacts associated with environmental expenditures. For example, one important impact of these expenditures is a reduction in income tax liability. Depreciation and annual expenditures serve to reduce taxable income, thereby reducing income taxes. Also, depending upon the tax year, the original purchase of equipment might have resulted in an investment tax credit. To account for these tax effects, BEN calculates the economic benefit using after-tax cash flows.

### b. Inflation

Inflation is another indirect factor that the BEN model accounts for. The BEN model initially converts all costs to dollars of the noncompliance year before it compares the cost of complying on time with the cost of complying late. The model uses the inflation rate to adjust the current or future cost of compliance into dollars from the year noncompliance began. The *BEN Users Manual* (see pages 4-27 to 4-29 and Appendix A of the manual) contains a more detailed discussion of the inflation factor.

### c. Discounting

A third impact relates to the *timing* of the cash flows since cash flows occurring in different years are not directly comparable. A basic concept of financial theory is "present value." This concept is based on the principle that: "A dollar today is worth more than a dollar a year from now," because today's dollar can be invested immediately to earn a return over the coming year. Therefore, the earlier a cost (or benefit) is incurred, the greater its economic impact. BEN accounts for this "time value of money" effect by reducing all estimated future cash flows to their "present value" equivalents.

This widely-used technique is known as "discounting" and "net present value" analysis. The *BEN Users Manual* (see pages 4-30 to 4-35 and Appendix A of the manual) contains a more detailed discussion of discounting and the concept of present value.

## II. Issues

The Agency is seeking comment on three categories of issues: (1) Broad economic benefit recapture questions, (2) the BEN model's calculation methodology and assumptions, and (3) the model's user-friendliness.

First, we invite comment on some fundamental questions the benefit recapture approach has raised. Is there a better way to measure benefit for settlement purposes than using the BEN model? In addition, what is the best approach to calculate the economic benefit derived from illegal profits?

Second, we invite comment on the BEN model's calculation methodology. While the Agency is confident that the BEN model's overall approach is theoretically sound, it welcomes constructive and documented comment on alternative approaches. In addition, EPA is aware of substantial differences of opinion with respect to the basis of some of the model's assumptions, particularly the discount rate and inflation rate. EPA requests comment on the BEN model's calculation methodology, or any other aspect of the model's assumptions or methodology.

Third, we request comment on the model's user-friendliness. The Agency has heard comments that the model is too difficult to use, particularly regarding BEN's ease of operation or how difficult it may be to obtain the data needed to run BEN. EPA has never been presented with any concrete evidence in support of these assertions. Thus, the Agency would like to either substantiate the problems and address them, or put these issues to rest.

### A. Broad Economic Benefit Recapture Issues

#### 1. Alternatives to BEN

EPA requests comment on whether there is a more accurate, simpler approach to measuring the economic benefit of delayed and avoided pollution control expenditures than the BEN model. The BEN model was designed to calculate the economic benefit of noncompliance for the vast majority of EPA's cases. While BEN has effectively served this purpose, the Agency recognizes that it should be improved or even replaced if a better alternative exists or could be easily developed. This is particularly relevant

as an increasing number of State and local government enforcement personnel are using the BEN model regularly. Any alternative approach must meet EPA's policy objective of ensuring that violators are put on an even financial footing with those regulated entities that comply on time. Alternatives should also be reasonably accurate, simple to use and readily understandable to the vast majority of the BEN model's users. These Federal, State and local government enforcement officials usually have limited knowledge of corporate or municipal finance or accounting.

## 2. Illegal Competitive Advantage

The Agency would like routinely to evaluate the economic benefit a violator derives from a competitive advantage gained as a result of the violation. While the Agency has maintained since 1984 that this was one aspect of economic benefit we would seek to recapture, EPA is seeking advice on what should be employed as a standard methodology to measure what that benefit is. This benefit can accrue to a violator in a number of different ways:

### a. Violator Sells Products at Below Market Price

Depending upon the particular market situation, a violator could sell its products at a lower price than its complying competitors because it does not have to pay for environmental compliance costs. It could then secure a bigger share in that particular market. For example, instead of controlling 25% of the market for a particular product, it controls 35% of the market. In theory, the extra 10% of the market is the economic benefit. Some of the key questions are: how do we assess and prove what share of the market came from underpricing, and how do we determine the value of that market share?

### b. Violator Sells Products That Were Prohibited by Law

Many of EPA's regulations prohibit the sale of certain products either permanently or until EPA reviews and approves them. If the violator produces and sells the prohibited product, the violator will achieve an economic benefit in two ways. First, it will make money directly from the sale of the product. Second, it will capture the market for the product, particularly if it is a new product. Some of the key questions here are: should the measure of economic benefit be gross sales, gross sales minus expenses, or some other measure? If it is the net, what expenses should be considered in determining the

net (e.g., how should EPA allocate advertising expenses for a violator producing more than one product)?

### c. Violator Initiates Construction or Operation Prior to Government Approval

Some regulatory requirements prohibit an entity from initiating construction or operation until it obtains a permit from EPA or another government agency. When a violator initiates construction or operation prior to this approval, it can begin operating earlier than it would have been able to do had it complied with the law. For example, if the violator's operation begins nine months earlier than it should have, the violator has an opportunity to generate sales it should not have made and gain a head start in developing its market. Some of the motivation to violate could be to take advantage of a business cycle (e.g., the violator illegally completes construction of a golf course without the required permits so that it can open at the start of the golfing season). Another incentive might be to initiate construction as soon as the financing is available and not wait until approval is given. (In either of these situations, we assume that the government will eventually issue the permit, if it does not, then every dollar produced by the new facility is an illegal economic benefit.)

One of the key issues here is: how should EPA determine the amount of benefit when a violator initiates construction or operation prior to government approval? Firms often expect to lose money on a new facility in the first few years of operation. Similarly, new businesses expect to lose money in the first few years of operation. For example, if a firm starts operating one year earlier than it should have, and if EPA only looks at the gross income minus the expenses, then the violator may be able to argue that it actually lost money the year it was in violation. Although that violator will ultimately be able to start showing a profit one year earlier than it should have, it will show a loss for that first year.

### B. The BEN Model's Calculation Methodology

Over the years, the BEN model has been criticized for alleged flaws in its calculation methodology. The two issues with the greatest potential impact involve the model's discount rate and its inflation rate. The Agency requests substantive and constructive comments on how the BEN model handles these two issues. In addition, comments are invited on all aspects of the calculation

methodology. Comments that address issues involving the calculation methodology should clearly state the rationale for the proposed changes. In addition, the commenters should address whether the proposed changes would add any complexity to the computer model. If any of them do add complexity, the commenter should state why the benefit of the change justifies the added complexity.

#### 1. Discount Rate Assumptions

The discount rate is an interest rate that reflects the violator's cost of capital. In essence, this is the cost of financing pollution control investments. The BEN model bases its discount rate for for-profit entities on the weighted average cost of capital (WACC) for a typical firm. This means that the cost of financing a project is based on a weighted average of a typical firm's cost of debt capital (e.g., bonds and bank loans) and equity capital (e.g., stocks). For municipalities, the discount rate is based on an average municipal bond yield for the top four grades as reported in Moody's *Municipal and Government Manual*.

The discount rate is a key assumption employed in the computer model. Any changes to the discount rate have a substantial effect on the BEN results. For a more detailed discussion of the discount rate, see the *BEN Users Manual* (at pages 4-30 to 4-35 and Appendix A).

#### 2. Inflation Rate Assumptions

The inflation rate variable is the annual rate at which the costs of environmental control measures have grown and are expected to grow over time. These cost increases are the result of various factors affecting supply and demand for particular products and services, as well as general inflationary pressures in the economy. BEN applies the inflation rate to adjust the cost of compliance measures as appropriate. The standard value of the inflation rate is based on a ten-year running average of the "Plant Cost Index" that appears in *Chemical Engineering*. For a more detailed discussion of the inflation rate, see the *BEN Users Manual* (pages 4-27 to 4-29).

### C. Improving the BEN Model's User Friendliness

EPA understands that some users find the program difficult to use. While that has not been EPA's experience, the Agency is interested in learning of any difficulties associated with running the model. Comments on these issues will be particularly helpful if they suggest realistic alternatives that would also

preserve the model's degree of precision.

#### 1. Is BEN Too Complex to Operate?

EPA invites comments on whether an aspect of the model's operation or its user's manual is overly complex. Although designed to be straightforward and easy to use, the Agency would welcome any suggestions to make the model and manual easier to use as long as we can preserve its degree of precision.

#### 2. Is the Information BEN Needs Difficult or Expensive to Obtain?

One of the main breakthroughs BEN achieved over its predecessor model was its streamlining of the data needed to operate the model. While the model requires a minimum of seven and a maximum of only eighteen pieces of data, some users find that the data is hard to obtain. This has not been EPA's experience as most, if not all the required data inputs, are based on facts that are already known to the litigation team as they are important to other parts of the settlement. Nevertheless, the Agency would welcome any suggestions as to how to make this data easier to obtain as long as we can preserve the model's degree of precision.

### III. Public Process

As part of EPA's effort to obtain comments on the BEN model, the Agency is planning to hold two public comment sessions. At those two meetings, interested parties may attend and provide verbal comments on the issues. The first one is scheduled for Washington, D.C. in the auditorium at EPA's Education Center at 401 M Street, SW, on November 6, 1996. The second one is scheduled for San Francisco at the Holiday Inn Golden Gateway at 1500 Van Ness Ave on November 13. Both meetings will begin at 9:30 a.m. and end at 4:00 p.m.

The Agency is especially interested in comments relating to the issues specified in this Notice. After the comment period closes, the Agency plans to review all the comments and revise its benefit recapture approach and the BEN computer model as appropriate. EPA encourages parties of all interests, including State and local government, industry, not-for-profit organizations, municipalities, public interest groups and private citizens to comment so that we can have as broad a spectrum as possible.

Dated: September 24, 1996.

Steven A. Herman,

*Assistant Administrator, Office of*

*Enforcement and Compliance Assurance.*

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