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# ENVIRONMENTAL REGULATION AND ELECTRIC UTILITY REGULATION: COMPATIBILITY AND CONFLICT

*Douglas N. Jones\**  
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## I. INTRODUCTION

Electric utility regulation falls into the area of public policy known as economic regulation. Economic regulation encompasses a range of government controls over the economic activities of business. The degree of governmental oversight inherent in these controls varies greatly. Suasion and appeal to "good corporate citizenship" bound the range at one end, while strict statutes, and vigorous surveillance and enforcement describe the other (intensive-control) end. In between these extremes, regulators place substantial trust in managerial motivations, the workability of markets, and the presumed happy coincidence of private with public interests over a broad spectrum of behavior.

Public utility regulation occupies a sector toward the intensive-control end of the economic regulation scale. Initiated by the states over a century ago for the control of railroads, economic regulation of selected monopoly (or near monopoly) industries has become a permanent feature of the American politico-economic landscape. In contrast to anti-trust laws, which attempt to break down privately contrived obstructions to competition, economic regulation accepts monopoly as a datum in some limited circumstances (in "natural" monopolies), and imposes on private management controls over price, service, reliability, earnings, accounting, financial structure,

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and occasionally, investment decisions. Public utility regulation is a peculiarly American amalgam of privately-owned capital operated under comprehensive public oversight.<sup>1</sup>

The time-honored objective of economic regulation is protection of the consumer's pocketbook. Ratepayers and their representatives, with the assistance of the media, make this point clear in their appearances before regulatory commissions. Somewhat less popular an objective, but nonetheless forcefully urged upon regulatory commissions by the regulatees, is assuring the economic viability of the regulated business, upon which the existence of the service itself depends in the long run. Regulatory commissions are necessarily preoccupied with reconciling these two conflicting objectives.

Now, enter a newcomer called "social regulation." Social regulation encompasses all manner of noneconomic regulation: environmental protection, consumer health and safety, worker health and safety, local economic development, and even hiring practices intended to further a number of societal goals. There is a tendency in public policy to view economic and social regulation as independent of one another, with social regulation imposing constraints on the interplay of economic forces. "Law and order," a "clean environment," a "safe workplace," and like objectives are generally thought to have criteria of their own, independent of costs. When it comes to particular cases, however, these objectives are compromised by cost. This last fact is as it should be, because there are few things, not even the preservation of life, that can be treated as absolutes, that is, irrespective of cost in the broadest sense of the term "cost." The tragedy is not that we are forced to consider cost, but that we do not consider cost consistently. Our predisposition to think of social goals as absolutes blinds us to the implicit inconsistency with which we compromise them. One of the results of this predisposition is that we achieve a good deal less than we could if we explicitly considered cost in setting social goals. Such consideration would lead naturally toward a more efficient allocation of resources among the various social goals.

This observation introduces the underlying message of the present article: social regulation will fall short of its potential achievement unless guided by economics. A corollary is that economic regulation, where applicable, provides a natural matrix in which to imbed social regulation. This is a statement of principle only, not an endorsement

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<sup>1</sup> For a textbook discussion of the natural monopoly concept and related aspects of public utility regulation, see 2 A. KAHN, *THE ECONOMICS OF REGULATION*, 113-71 (1970).

of all instances of economic regulation. Where economic regulation is not applicable, other means of introducing economics, on which this article will not comment, need to be found.

As an example of how economic regulation may be used to improve social regulation, this article focuses on the interrelationship between the social regulation of air pollution control and the economic regulation of electric utility regulation. Initially, this article examines the organization of electric utility regulatory structures, and how they affect the interaction between the economic and social regulators. This article then touches briefly on the utility accounting and the process by which electric power rates are set. Thirdly, this article discusses the use of tax law to influence the pollution control activities of utilities. From these three sections, a common pattern emerges: social regulation acts as a restraint on economic regulation. Like oil and water, current social regulation and economic regulation do not mix. This is a pity because the goals of social regulation are widely accepted, and the importance of efficiency to the economy is widely acknowledged.

The final section speculates on the advantages and means of integrating economic and social regulation in the small sector of the economy occupied by electric utility regulation. That is, we are interested in how the oil and water can be made to mix. Neither environmental nor electric utility regulation are ready for complete unification, but an interesting amalgam might be formed in the future by combining the two in a common procedure in which the public interests of pollution control and rate control are considered simultaneously. Ideally, pollution control should enter the electric power pricing process as a cost subject to conventional cost controls, rather than as an autonomous constraint, as it does now. Such an amalgam could result in effective pollution control and effective rate control, as well as effective enforcement. What such an amalgam in this small sector of the economy might mean to the rest of the economy remains to be seen. Some steps toward pricing of pollution have been taken elsewhere, as we shall note.<sup>2</sup> If anything, these make the case for the integration of economic and social regulation all the stronger.

## II. THE ROLE OF ECONOMICS IN SOCIAL REGULATION

The importance of economizing to achieve social goals is illustrated in two examples below. Where social goals are pursued as absolutes,

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<sup>2</sup> The reference is to trading in emissions reduction credits (ERC's). See *infra* notes 26-27 and accompanying text.

public policy is blind to the economic consequences of a given solution. Society's resources are allocated inefficiently. The result is an even greater compromise of social goals than otherwise necessary. Where economic factors are taken into account, social goals are achieved more efficiently, and compromise, though explicitly acknowledged, is less damaging to the goals.

First, consider estimates of cost per life saved of programs supported, operated, or mandated by the federal government. In the late 1970's, we were spending 3.75 times more to save a life in some medical programs than in others, 2.67 times more in some safety programs than in others, and 16 2/3 times more in some military programs than in others. Expenditures by the private sector that were mandated by society could be over \$100,000,000 per life saved.<sup>3</sup> Even though this is not the highest figure cited by Bailey, it is 1389 times as much as the estimated cost (\$72,000) that society paid to save a life by kidney transplant.<sup>4</sup> These data show that there is no systematic relationship between expenditures and lives saved, neither within the public sector nor between the public and private sectors.

The figures imply that there are dramatic opportunities to use resources more effectively. For example, if we reduced the proposed standard for the chemical acrylonitrile, taxed the chemical industry for the amount saved, and spent the taxes for highway safety, we could save lives at approximately a thousand times the rate we save them by policies adopted for the chemical acrylonitrile.<sup>5</sup> We could save many more lives than we do now without consuming any more resources, but simply by reallocating our expenditures from the inefficient to the efficient programs. This conclusion assumes that we have no ethically acceptable way of distinguishing lives saved by one program from those saved by another program.

How does it happen that public policy is so wide of the mark? No complete answer is attempted here, but we would suggest that the most important reason is that social regulation is not planned in a comprehensive way. The programs cited above and many others have been undertaken in response to a perceived need to do something, always particular to specific circumstances, but with no general criteria as to what should be done. Public policy conceives of the goal of saving lives as an absolute. In practice, however, saving

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<sup>3</sup> M. BAILEY, *REDUCING RISKS TO LIFE* (1980) (Table 4).

<sup>4</sup> *Id.*

<sup>5</sup> Bailey gives an estimated cost per life saved by the proposed standard for acrylonitrile of \$1,963,000 to \$642,976,000. *Id.*

lives is subject to arbitrary constraints: we should do "whatever is necessary" or "whatever is technically feasible." But these are empty words. For example, it is technically feasible to do without automobiles and thereby eliminate all deaths arising from the use of automobiles.

We depend on chance to settle the important question of how much resources we shall devote to saving lives. Chance, though, is never the same in two different programs. As a result of our collective unwillingness to address explicitly the economics of saving lives, we are saving far fewer lives than we could with the resources devoted to that purpose.

Environmental statutes exemplify this unwillingness to address economics in social regulation. Environmental statutes characteristically state their goals without reference to economic considerations. The Clean Air Act<sup>6</sup> prohibits the balancing of costs and benefits, but a system of cost minimization is inherent in the emission-reduction credit program<sup>7</sup> currently promoted by the Environmental Protection Agency, described below. The Water Pollution Control Amendments of 1972<sup>8</sup> are famous for their absolute goal, stated in the preamble, "that the discharge of pollutants into the navigable waters be eliminated by 1985."<sup>9</sup> At the same time, however, the amendments somewhat inconsistently require only that, by 1983, permittees meet effluent limitations based on the "best available technology *economically achievable . . .*"<sup>10</sup>

Needless to say, the goal of eliminating pollution discharges has faded. But it would be wrong to infer from this that economics conflicts with environmental protection. The opposite is the case. Only by economizing can we make best use of our resources and more effectively achieve pollution control, or any other social goal. Economics does not conflict with environmental protection. Economics conflicts with absolutes. Social regulation pays lip service to absolutes but finds economizing necessary, though it accepts economics with no consistent logic.

Our second example is drawn from a study of effluent control costs in the Delaware Estuary.<sup>11</sup> The study considered four methods of

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<sup>6</sup> 42 U.S.C. §§ 7401-7626 (1982).

<sup>7</sup> Major regulations in the emissions reduction credit program over the ten year period 1975-84 are tabulated in Table 2 in T. TIETENBURG, EMISSIONS TRADING: AN EXERCISE IN REFORMING POLLUTION POLICY 10 (1985).

<sup>8</sup> Pub. L. 92-500, 86 Stat. 816 (1972) (codified as amended at 33 U.S.C. §§ 1251-1376 (1982)).

<sup>9</sup> 33 U.S.C. § 1251(a)(1)(1982).

<sup>10</sup> 33 U.S.C. § 1312(b)(2)(A)(i)(1982) (emphasis added).

<sup>11</sup> Johnson, *A Study of the Economics of Water Quality Management*, 3 WATER RESOURCES RES. (1967).

assigning abatement responsibility among polluters for each of two levels of dissolved oxygen (DO) throughout the estuary and calculated costs for each method. See Table 1. The first method was uniform treatment (UT), in which the same proportional removal of oxygen-depleting wastes was imposed on all polluters. This approach is closest to present policy and ignores problems of enforcement. The second method assumed a uniform effluent charge (UEC) throughout the basin. The reason pollution control costs are lower for this method than for the UT method is that the polluters themselves choose how much abatement is in their own self-interest. Those with high costs of abatement pay the charge and dump pollutants into the river. Those polluters with low costs of abatement find abating less expensive than paying the charge. Thus, any given level of control (two levels are shown in Table 1) is achieved with varying levels of abatement among polluters, as opposed to the uniform abatement levels which the UT approach requires.

TABLE 1.  
Cost of Treatment with Alternative Programs

DO Objective (ppm)	Program			LC
	UT	UEC (millions of dollars per year)	ZEC	
2	5.0	2.4	2.4	1.6
3-4	20.0	12.0	8.6	7.0

Source: Johnson, Edwin L., *A Study in the Economics of Water Quality Management*, WATER RESOURCES RESEARCH, Vol 3, (Spring, 1967), at 297.

The UEC approach is more efficient than the UT approach because those with low costs of pollution self-select to abate more; those with high costs of pollution self-select to abate less. The UEC approach adjusts the effluent charge level to produce the same total abatement as with UT.

One might think that a surer way of achieving the result would be by commanding the polluters to proceed as calculated for UEC, but without levying the charge. The opposite is true, however, because enforcement of finely differentiated standards is an impossible concept. Enforcement of uniform standards is also impossible, though we keep trying.<sup>12</sup> The advantage of the effluent charge ap-

<sup>12</sup> For a discussion, see Downing, *Bargaining in Pollution Control*, 11 POL'Y STUD. J. 577-85 (1983); Downing & Kimball, *Enforcing Pollution Control Laws in the U.S.*, 11 POL'Y STUD. J. 55-64 (1982).

proach is not limited to efficiency, but extends also to enforcement. Polluters respond to an emissions charge in the same way they respond to any cost of doing business: they minimize its effect on profits. In other words, as long as the cost of not polluting is less than the charge, polluters try to avoid the charge by not polluting.<sup>13</sup>

The third alternative in Table 1 is a zoned effluent charge (ZEC). Here, the Delaware Estuary was divided, on paper, into five zones, and different effluent charges were set for each zone. The charges were different because different levels of abatement can be imposed on different zones and still achieve the DO targets, due in part to natural aeration (self-treatment by the river) and synergistic relationships among the wastes. Efficiency is again improved, at least at the higher DO level.

The last alternative, the least cost (LC) approach, is included primarily for reference purposes. The LC approach assumes that charges vary continuously over the hundred mile stretch of river. While we make no claim of administrative or enforcement practicability, it should be noted that fully differentiated financial assessments possess the same advantage over fully differentiated abatement commands as do uniform charges over uniform abatement commands. In both cases, economic regulation via financial assessments results in lower pollution control costs than does a system of inflexible abatement commands. As the Delaware Estuary study suggests, social regulators could make better progress towards solving a given problem, and use fewer resources, if social regulation were molded into a framework of economic regulations, rather than imposed as a separate system.

How might social regulation be molded into a framework of economic regulation? Can experience with electric utilities, which are subject to simultaneous economic and social regulation, provide insights? In search of answers, we explore regulatory policy for the electric power industry, beginning with the structure of regulation.

### III. REGULATORY STRUCTURES

At the state level, different agencies carry out environmental regulation and economic regulation of public utilities. There are no exceptions to this proposition, though in a few instances the state

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<sup>13</sup> For a defense of this argument by a group of attorneys, as well as some other advantages of the effluent charge approach, see F. ANDERSON, ENVIRONMENTAL IMPROVEMENT THROUGH ECONOMIC INCENTIVES (1977).



public utility commission (PUC) participates in some aspect of environmental regulation. As of 1984, PUC's in two states, Arkansas and Oklahoma, incorporated provisions limiting pollution emissions into their rules.<sup>14</sup> PUC's in two other states, Virginia and Washington, require compliance with clean air and water quality standards.<sup>15</sup> In power plant siting, there is a necessary interplay of environmental and electric power concerns, including alternative transmission corridors or power-sharing arrangements. Statutes in three-fifths of the states require an "environmental review" of this process.<sup>16</sup> Similar issues can arise in design and location of pumped waste storage, where scenic (environmental) considerations are also present. Within some state governments, environmental regulators view economic regulatory agencies as good sources of information about the industry. Furthermore, when a meeting is convened in state government offices on "energy matters," agency representatives from the concerned departments—Environment, the Public Utility Commission, perhaps Economic Development, and Conservation—typically gather around the table. Aside from these interactions between the PUC's and environmental agencies, coordination and cooperation are minimal, and rarely affect individual agency behavior in terms of yielding turf or territory.

The courts have further enforced the view that social regulation shall enter as a constraint on economic regulation. This point was made as early as 1971 in the area of air quality control for electric utilities. In 1970, the California Public Utility Commission overruled the Orange County Air Pollution Control District's denial of a Southern California Edison Company application to construct two electric power generating units.<sup>17</sup> The California Supreme Court found that in doing so, the Public Utility Commission "has acted in excess of its jurisdiction."<sup>18</sup> Thus the California PUC was without authority to prevent a denial of operating rights to California Edison by the Orange County Air Pollution Control District.

The area of ratemaking contains other examples of social regulation acting as an external constraint on economic regulation. For example, it is the practice of utilities to charge pollution control

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<sup>14</sup> NATIONAL ASS'N OF REGULATORY UTIL. COMM'RS, 1984 ANNUAL REPORT ON UTILITY AND CARRIER REGULATION 567 (Table 46).

<sup>15</sup> *Id.*

<sup>16</sup> *Id.* at 718 (Table 82).

<sup>17</sup> *Re Southern California Edison Co.*, 86 Pub. Util. Rep. 3d (PUR) 482 (1970).

<sup>18</sup> *Orange County Air Pollution Control Dist. v. California Pub. Util. Comm'n*, 90 Pub. Util. Rep. 3d (PUR) 389, 396 (1971).

expenses to ratepayers. In 1971, the Virginia Supreme Court affirmed that expenses of environmental protection are allowable (i.e., a recoverable business cost) for rate making purposes.<sup>19</sup> Also in 1971, the Pennsylvania Public Utility Commission allowed higher operating costs of an electric utility resulting from a switch of coal to oil in order to reduce sulfur emissions.<sup>20</sup> The Pennsylvania Commission also addressed in 1971 how to allocate the "air quality fuel charge" among customer classes.<sup>21</sup> In 1974, the New York Public Service Commission affirmed that an electric power company's environmental costs should be included among operating expenses.<sup>22</sup>

As these examples show, the typical pattern is for social regulators independently to impose social regulations, perhaps after consultation with the regulated business firm and/or, in a few states, on the basis of information and advice from the PUC. Whatever the process, the PUC is eventually faced with a *fait accompli* and must make a decision on whether expenses of social regulation accruing to the regulated firm are recoverable from rates charged by that firm. By adding yet another factor into the PUC's calculations, environmental agencies further complicate an already difficult job of reconciling low consumer rates with adequate utility earnings.<sup>23</sup>

Another facet of air pollution control involves three price-like mechanisms authorized by the national Environmental Protection

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<sup>19</sup> Commonwealth of Va. v. Va. Elec. & Power Co., 89 Pub. Util. Rep. 3d (PUR) 395 (1971).

<sup>20</sup> Pennsylvania Pub. Util. Comm'n v. Philadelphia Elec. Co., 91 Pub. Util. Rep. 3d (PUR) 321 (1971).

<sup>21</sup> *Id.*

<sup>22</sup> Opinion No. 74-5, Case 26402 (February 5, 1974).

<sup>23</sup> Two examples help make the general point. First power plants are designed and operated according to the engineering economics of system planners with the object of dispatching generating units so as to minimize costs under specific constraints. It would seem that to include a constraint of some given level of pollution control into the utility system program, while clearly feasible, would change the operating function from one of the conventional economic dispatch to the "social dispatch of power." Unless redefined, the relatively straightforward minimum cost criterion would seem to have been lost and the traditional basis for power dispatch made more ambiguous.

Second, there is the issue of horizontal equity among firms and industries. Businesses care about their overall cost structures in relation to other business firms—particularly actual or potential competitors. Even (near) monopolies are not entirely immune from these considerations. Not only can there be the question of intercompany and interregional competitiveness for power systems, there is also the matter of fuel switching that may alter the final opportunity for large power consumers to "shop around." Electric utilities must therefore pay more attention to the remaining competition to avoid losing customers to, say, the gas industry. The point here is that if environmental protection requirements are unevenly applied within a region, or region-to-region, or industry-to-industry, the resulting cost functions of the firms will differ as will the final price of the service.

Agency (EPA). These are offsets, "bubbles", and emission reduction credits. The purpose of all three is to permit substitution of one source of air pollution for another with the result of reducing pollution control costs, as described below. The interesting, and perhaps curious, fact for our purposes is that the PUC's played no role in designing these three concepts and seem largely to be passive recipients of their effects. This is unfortunate, for the three mechanisms explicitly involve economic issues important to both electric utilities and PUC's.

Offsets are essentially barter agreements between pairs of polluters. For example, if a new source wants to enter a metropolitan area in which there is already too much air pollution, that source must find a polluter already in the air shed that is phasing out its pollution. The new source can then use the existing polluter's reduction in pollution as an "offset" to its pollution and thus gain rights to emit into the air shed. Offsets introduce the possibility of trading in "pollution rights." Cases exist in which a prospective entrant paid an already established polluter the cost of reducing the latter's pollution. For example, Elliott reports that Sohio persuaded Southern California Edison to accept a \$78 million stack-gas scrubber to receive a sulfur oxide offset that would permit Sohio to build a terminal in the Los Angeles area.<sup>24</sup>

"Bubbles" apply to groups of smoke stacks or air pollution sources under the control of a common owner. The image is that of a figurative "bubble" around a plant. The only thing social regulation is concerned with is the pollution emanating from the "bubble," regardless of which source inside the bubble the pollution came from. Bubbles enable the plants to control pollution using the least costly method to control sources.<sup>25</sup>

Emission reduction credits (ERC's) are similar to offsets in that both allow trading of pollution "rights." Polluters who reduce emissions below the limits set by the social regulators get ERC's for the amount of the reduction. The polluters are then allowed to sell these ERC's to others. Plants may also bank ERC's for later use, or lease, subject to a variety of rules that vary by local jurisdiction.<sup>26</sup> Optimal

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<sup>24</sup> Elliott, *Full Cost Emissions Charges for the South Coast Basin*, 7 THE ENVIRONMENTAL PROFESSIONAL 57 (1975). Sohio was forced to withdraw its application for other reasons. Several other examples of similar transactions involving offsets appear in T. TIETENBERG, ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS 306-07 (1984).

<sup>25</sup> See *supra* text accompanying notes 11-13.

<sup>26</sup> Leslie Sue Ritts et. al., "Comparison of Selected State Banking Rules," Environmental Law Institute (September 20, 1982).

allocation of pollution control would arise from a well-working ERC program. Those plants that are more efficient at controlling pollution have the incentive to do so and to then sell (or lease) their rights. Those that are less efficient have the incentive to spend their money on rights. ERC's achieve the same total abatement at lower cost than does uniform treatment, as the Delaware Estuary example shows.<sup>27</sup>

In developing the offsets, bubbles, and ERC's, the PUC's have been on the outside from the beginning, despite the obvious implications of these concepts for cost control. Raufer and Feldman conducted a survey of members of both the electric power industry and economic regulatory commissions. They found the following for PUC's in the fourteen states thought to contribute the most to the acid rain problem:

While the utilities were very familiar with emissions trading, the same cannot be said for the public utility commissions. Four of the fourteen PUC's were familiar with emissions trading. An identical number had never heard of it at all—including some of the key states likely to bear a considerable portion of the emissions reductions. The remaining PUC's had heard of emissions trading, but were not familiar with its components.

The PUC survey group split evenly concerning the likely role they would play in emissions trading in an acid deposition program. Half said they have an environmental mandate and would take an active role in reviewing control options; the other half stated that they focused solely on economic and financial issues, and while they would probably review an emissions trade, major decisions on the matter would lie with the state's air pollution control agency.<sup>28</sup>

It is not possible to focus on economic and financial issues without considering the costs of pollution control. Electric utility accounting is inevitably involved when an asset is acquired. ERC's are assets. But they are assets whose value is determined by the social regulators. Social regulators set the standards, define the ERC's life duration, decide whether the ERC's depreciate with time, approve or disapprove ERC trades and by other rules affect their value. Expenditures by a utility for ERC's may or may not be approved

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<sup>27</sup> For a discussion of offsets, bubbles and ERC's, see Tietenberg, *Uncommon Sense: The Program to Reform Pollution Control Policy*, in REGULATORY REFORM 290-301 (L. Weilss & M. Klass eds. 1986).

<sup>28</sup> Raufer & Feldman, *Emissions Trading and What it May Mean for Acid Deposition Control*, 114 PUB. UTIL. FORT., August 16, 1984, at 24.

by a PUC and, if approved, the expenditures must be taken into account in setting electric power rates.

The EPA's new source performance standards (NSPS) for electric power plants<sup>29</sup> illustrate how far we are from coordination of social and economic regulation. A minimum of seventy percent removal of sulfur oxides was required in 1979 for all new coal-fired generating plants, regardless of the sulfur concentration of the coal.<sup>30</sup> This requirement made the electricity from new power plants relatively more expensive in the growing areas of the West and South, where low sulfur coal might be used, than electric power from older plants in the East and Midwest, which are not subject to NSPS. According to a careful analysis by Crandall, the effect was deliberately political, designed to retard the economic development of the South and West for the benefit of the older industrial regions of the country, the Northeast and Great Lakes areas.<sup>31</sup> Here, social regulation was used as a gimmick to counter economic rationality.

More recently, the Congressional Office of Technology Assessment (OTA) investigated the merits of technology-forcing regulation in connection with acid rain control. The OTA estimated in 1984 that the mandated use of control technology (scrubbers) to achieve required emissions reductions of about 5 million tons would result in added annual costs of \$1.4 billion.<sup>32</sup> However, if emitters could choose the most cost effective method, such as low sulfur coal, the annual added cost would be between \$600 million and \$900 million (about fifty percent of the cost of mandated technology).<sup>33</sup> Here, economic regulators could assist in assuring that the emitters had an interest in the least cost method, providing that social regulations did not prescribe the technology.

To summarize our conclusions in this section: (1) pollution control is a cost of electric power production inherently outside the purview of PUC's because prescribed by social regulations, often specific to the technology that must be used; (2) at the forefront of pollution control regulation, offsets, bubbles, and ERC's offer the possibility of economizing; and (3) the PUC's have had very little to do with offsets, bubbles and ERC's, despite the importance of these concepts

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<sup>29</sup> 40 C.F.R. §§ 60.40a-.49a (1986).

<sup>30</sup> *Id.* § 60.43a(a); Portney, *How Not to Create a Job*, 6 REGULATION 36 (Nov./Dec. 1982).

<sup>31</sup> R. CRANDALL, CONTROLLING INDUSTRIAL POLLUTION 110-30 (1983); *see also* B. ACKERMAN & W. HASSLER, CLEAN COAL/DIRTY AIR (1981).

<sup>32</sup> UNITED STATES CONGRESS, OFFICE OF TECHNOLOGY ASSESSMENT, ACID RAIN AND TRANSPORTED AIR POLLUTANTS 169 (table A-7) (1984).

<sup>33</sup> *Id.*

for reducing electric power costs. The possible gains from more widespread use of offsets, bubbles, and ERC's are suggested by analogy with the preceding value-of-life<sup>34</sup> and Delaware Estuary<sup>35</sup> examples. The broader context of pollution control policy continues to be dominated by counter-economizing, as suggested by Crandall's evaluation of NSPS's for coal-fired power plants<sup>36</sup> and the OTA analysis of costs of acid rain control.<sup>37</sup>

None of the foregoing implies that we have either too much or too little pollution control, but only that pollution control is an economic problem and deserves to be tackled in an economic context. We are getting less pollution control than we could for the resources devoted to it as matters now stand. This result is inherent in the rejection of economics by public policy. One route to obtaining more pollution control and better cost control of electric power is to better integrate decisions on the two.

#### IV. UTILITY ACCOUNTING AND REGULATORY PRACTICE

This section describes how pollution control costs are treated in economic regulation. Not only are pollution control costs independently implied by social regulations, as noted in the preceding section, but they are also accommodated in ways that abridge pre-existing cost control practices of economic regulation. And, as if to further confound a disinterested observer, these abridgements were initiated by the Federal Power Commission, the nation's leading economic regulatory agency in electric power at the time.

The single most important guideline in rate level, or earnings control cases is the "fair return on fair value" rule:

$$RR = OE + CD + r(OC + I - D).^{38}$$

Here,

RR = the Revenue Requirement (total dollars to be raised);

OE = Operating Expense (of doing business);

CD = Current Depreciation;

r = the Rate-of-Return (percent earnings on the value of the capital employed in the business);

<sup>34</sup> See *supra* text accompanying notes 3-4.

<sup>35</sup> See *supra* text accompanying notes 11-13.

<sup>36</sup> See *supra* text accompanying note 31.

<sup>37</sup> See *supra* text accompanying note 32.

<sup>38</sup> For present purposes, complexities resulting from taxes and alternative methods of property valuation are ignored.

- OC = Original Cost (of the capital employed, sometimes partly adjusted for inflation);  
I = Improvements (in the capital employed); and  
D = Accumulated Depreciation (in value of the capital employed).

This formula is used by PUC's from time to time to set a target for rate adjustments. It is not used for continuous rate adjustment, except in the case of fuel cost increases, which, in many jurisdictions, are automatically reflected in rate increases.

The distinction between increases in operating expenses and capital is important. The utility recovers operating expenses on a one to one basis. Property increments, however, carry with them an added revenue benefit for the utility in the form of the rate of return. Other things being equal, and with a rate of return at least as high as utility stockholders could otherwise earn, the utility has an interest in adding to property, as long as regulators include that property in the rate base, i.e., in the expression in brackets in the above equation. This fact makes any investment that the regulatory commissions find "used and useful" for power generation,<sup>39</sup> including pollution control equipment,<sup>40</sup> more attractive to the utility. Environmental agencies and other parties of similar interest should take this incentive situation into account.

Another important consideration in rate setting is the much-discussed Construction Work in Progress (CWIP). The debate about the appropriateness of CWIP in utility regulation focuses on the question of whether additions to a plant should be excluded from rate base—and thus prohibiting the utility from earning a return on the cost of the additions—until the plant is "on-line" and operational, or whether these construction costs should wholly or partly be added to rate base, along the way—and hence currently payable by the ratepaying public—even before the plant can meet the traditional "used and useful" test. It is in the use of the latter convention, that is, including CWIP in the rate base, that social regulation led the way to some crumbling of traditional cost control.

Before 1976 the Federal Power Commission (FPC), which had regulatory authority over the transmission and sale at wholesale of

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<sup>39</sup> The term "used and useful" is a term of art in the utility regulation field. In its strictest application it refers to the investment in plant and equipment in service and necessary to the utility's doing business.

<sup>40</sup> There are states, however, in which the financing of this portion of the investment is handled in such a manner that PUC's exclude it as an earning asset.

electric energy in interstate commerce, did not allow CWIP in the rate base of utilities under its jurisdiction.<sup>41</sup> In December, 1976, the FPC announced three exceptions to this prohibition. Only two of these concern us here. The FPC declared that, essentially from 1977 onward, CWIP treatment would be accorded to: (1) construction of pollution control facilities, and (2) conversion from oil and gas plants to plants using another fuel (primarily coal).<sup>42</sup>

The reasoning behind the FPC's singling out of environmental matters for preferential treatment with respect to regulatory accounting is instructive. At the time, the FPC placed considerable weight on the intertemporal argument against CWIP. The basic argument was that it was unfair to make current ratepayers pay for facilities they might not use, and that would otherwise be provided by future ratepayers. In spite of this disinclination, the FPC issued the following order:

At the present time, there is only one area where the Commission has agreed for all companies that [it would be equitable to impose the cost of future facilities on current users]. This is in the area of facilities which are required because of the current generation's commitment to the control of pollution, of its consumption of existing stocks of natural resources. Thus, we will allow the inclusion of CWIP in rate base where construction is to facilities to be used for pollution control, or for the conversion to the burning of other fossil fuels of plants which now burn oil or gas. In these cases, it is the profligacy of the present generation which requires the new facilities, and we consider that the equitable argument favoring this allocation of costs is sufficient to tip the balance in favor of the allowance of CWIP of these facilities.<sup>43</sup>

The FPC confined the use of this feature somewhat by noting that it did not intend inclusion of CWIP to apply to facilities that lessen pollution by substituting a different non-polluting method of power generation, nor to facility additions for generation of the extra power needed for the operation of the pollution control equipment itself.<sup>44</sup> The FPC sought to further confine its employment by citing "as a

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<sup>41</sup> For a discussion of the "fair return on fair value" rule, see *supra* text accompanying note 38.

<sup>42</sup> FPC Docket No. RM75-13, Order No. 55, "Order Adopting in Part Construction Work in Progress Rulemaking and Terminating Proceedings," November 8, 1976, at 14-16. The third case was for a clear showing of severe financial difficulty by a utility which cannot otherwise be reasonably alleviated.

<sup>43</sup> *Id.* at 8-9.

<sup>44</sup> *Id.* at 9.



useful guide" the Internal Revenue Service's language in defining allowable tax treatment of pollution control facilities.<sup>45</sup> Finally, the FPC offered examples of pollution control items it did have in mind as qualifying for CWIP treatment. These examples were:

1. Air pollution control facilities:
  - a. Scrubbers, precipitators, tall smokestacks
  - b. Changes necessary to accommodate use of environmentally clean fuels such as low ash or low sulfur fuels including storage and handling equipment
  - c. Monitoring equipment;
2. Water pollution control facilities:
  - a. Cooling towers, ponds, piping pumps
  - b. Waste water treatment equipment
  - c. Sanitary waste disposal equipment
  - d. Oil interceptors
  - e. Sediment control facilities
  - f. Monitoring equipment;
3. Solid waste disposal costs:
  - a. Ash handling and disposal equipment
  - b. Land
  - c. Settling ponds.<sup>46</sup>

The societal goal of a cleaner environment is the force behind this federal regulatory commission's actions with respect to power production. The fact that the FPC (and now the Federal Energy Regulatory Commission (FERC)) never allowed CWIP in the rate base on the basis of "severe financial distress" the five times (by 1983) that utilities used that non-environmental argument in seeking such inclusion indicated the narrowness of the agency's intended application of CWIP.<sup>47</sup> In short, utilities could not use CWIP to prop up utility earnings except in the most compelling cases, but could use CWIP as an incentive for environmental improvement. Some evidence of the power of that incentive appears in Table 2.

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<sup>45</sup> *Id.* That definition includes "a new identifiable treatment facility which is used . . . to abate or control water or atmospheric pollution or contamination by removing, altering, disposing or storing of pollutants, contaminants, wastes, or heat . . ." I.R.C. § 169(d)(1) (1982).

<sup>46</sup> FPC Docket No. RM75-13, Order No. 55 at 10-11.

<sup>47</sup> LIBRARY OF CONGRESS, CONGRESSIONAL RESEARCH SERVICE, CONSTRUCTION WORK IN PROGRESS 97th Cong., 2d Sess. 10 (1982). After 1984 the FERC liberalized its use of CWIP.

Thus, as Table 2 shows, at the end of 1980, investor-owned electric utilities had reported \$20.5 billion in electric plants in service attributable to environmental protection facilities. Also \$6.58 billion of environmental CWIP was recorded. This last figure accounted for about 11 percent of all electric CWIP at that time. By the end of 1984 almost \$13 billion more had been added to plant, and CWIP had increased by about \$3.3 billion.

Investment in environmental protection facilities implies spending on their operation. Table 3 indicates the magnitude and types of these expenses in 1980 and 1984. In the four-year period total environmental protection expenses for electric utilities rose from \$1.6 billion to \$2.2 billion, or by about 38 percent. Those environmental protection expenses accounted for 2.9 percent and 3.6 percent of total power production of electric utilities' expenses in each of the same two years, respectively.

State commission actions with respect to CWIP treatment, however, are mixed. While the situation is not static, the count by early 1985 was something like the following:<sup>48</sup> about 12 states bar the admission of CWIP under any circumstance; another 8 states allow it unconditionally; and the remaining 30 permit conditional use of

TABLE 2.  
Environmental Protection Facilities, Cumulative Investments  
1980 and 1984 (thousands of dollars)

Item	Amount	
	1980	1984
(Included in electric utility plant in service)		
Air pollution control facilities	\$ 8,992,909	\$15,525,903
Water pollution control facilities	3,752,447	6,148,600
Solid waste disposal costs	1,227,815	1,847,816
Noise abatement costs	196,988	237,882
Esthetic costs	4,593,318	6,306,860
Additional plant capacity	1,144,027	1,537,204
Miscellaneous protection facilities	595,603	1,428,056
Total	\$20,503,097	\$33,032,321
Construction work in progress	\$ 6,577,308	\$ 9,914,206

Source: STATISTICS OF PRIVATELY OWNED ELECTRIC UTILITIES IN THE UNITED STATES (1980) at 574, and FINANCIAL STATISTICS OF SELECTED ELECTRIC UTILITIES (1984) at 738-39, Energy Information Administration, Washington, D.C.

<sup>48</sup> 1984 ANNUAL REPORT ON UTILITY AND CARRIER REGULATION, *supra* note 14, at 450-51 (Table 14a).

TABLE 3.  
Environmental Protection Expenses, 1980 and 1984 (thousands of dollars)

Item	Amount	
	1980	1984
Depreciation	\$ 212,630	\$ 437,931
Labor, maintenance, material, and supplies	275,048	498,636
Fuel, related costs		
Operation	49,341	72,179
Fly ash and sulfur removal	112,735	149,156
Difference in cost of environmentally clean fuel	817,260	780,641
Replacement power costs	45,698	47,501
Taxes and fees	14,213	46,497
Administrative and general	24,651	54,765
Other	67,228	93,564
Total	\$1,618,797	\$2,180,870

Source: STATISTICS OF PRIVATELY OWNED ELECTRIC UTILITIES IN THE UNITED STATES (1980) at 575, and FINANCIAL STATISTICS OF SELECTED ELECTRIC UTILITIES (1984) at 752, Energy Information Administration, Washington, D.C.

CWIP. About a dozen of the states that allow CWIP in some situations follow the original FPC criteria in varying degrees.<sup>49</sup> One state and the District of Columbia allow CWIP in rate base only for pollution control expenditures. The exact category in which a state falls can vary from year to year, but the figures are representative.

A further element in the PUC's treatment of CWIP is whether the estimated interest that could be earned on funds used during construction is required to be an offset to CWIP at the time of plant completion or whether the allowance from funds used during construction (AFUDC) amounts become an additional part of the rate base.<sup>50</sup> If an offset, rates to ratepayers would be lower than when not an offset. At least two states that otherwise require AFUDC offsets against CWIP do not require offsets in the case of pollution control CWIP.<sup>51</sup> Thus, to an important degree, state commission policy follows federal policy in giving special status to pollution control investments.

One might assert that the general softening of public utility regulation toward CWIP would have taken place in the absence of pollution control. We refer to the dozen states that unconditionally

<sup>49</sup> *Id.*

<sup>50</sup> *Id.*

<sup>51</sup> The states are Delaware and Virginia. *Id.*

(without reference to pollution control considerations) include CWIP in the rate base and the rather large intermediate group that allow CWIP in circumstances extending beyond pollution control. In the former group of states, the embrace of the CWIP concept probably implies a dominant concern to bolster earnings. In the latter group, it is impossible to say how much weight the states give to general earnings considerations and how much to pollution control. Both considerations are undoubtedly present. Whatever the cause for the use of CWIP to bolster earnings in general, there can be no doubt that CWIP's present status results in part from the way we are financing pollution control. In the broader context of this analysis, the preferential treatment of pollution control costs reflects an adoption by economic regulation of the same absolutist view of pollution control as characterizes public policy in general. As before, we note that an absolutist view plays havoc with the achievement of the social goal it is intended to promote. Here we add that it plays havoc with cost control in economic regulation. Stated differently, society attempts to make up for failures of our pollution control policy by weakening economic regulation.

#### V. TAX PREFERENCES AND REGULATION

Additional preferential treatment of pollution control expenditures comes through tax policy. Tax law constrains public utility regulators to assure that tax breaks accrue to the benefit of the utilities, as opposed to electric power consumers. These tax breaks are especially important for pollution control equipment, though they apply to other investments as well. Electric utilities, more than most American industries, benefit from tax breaks for pollution control. Thus, electric utilities made 31 to 37 percent of all pollution control expenditures by all American industries in the period of 1980-84.<sup>52</sup>

The question is not whether we have pollution control, but who pays for it. To the extent that the public pays for it (via tax preferences in the present context), there is no incentive for efficient pollution control by the polluters, nor do polluters have an economic reason to restrain pollution, to adopt cost-saving technologies, or even to develop these technologies in the first place. Here, again, social goals could be more efficiently and completely achieved if social regulation were better integrated into the economy. Examples of

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<sup>52</sup> Russo & Rutledge, *Plant and Equipment Expenditures by Business for Pollution Abatement, 1983 and Planned, 1984*, 64 SURV. OF CURRENT BUSINESS 34 (1984).

mischief created by a failure to address economic aspects of social regulation arise in the value-of-life case,<sup>53</sup> the Delaware Estuary case,<sup>54</sup> discussion of the Congressional OTA study,<sup>55</sup> and in the abridgment of cost control via CWIP and attenuated surveillance of pollution control investments in general by public utility regulators.<sup>56</sup> Consider now the tax preference case.

The special treatment that economic regulation gives pollution control investments is comparable to a variety of ways public policy in general subsidizes pollution control. Some of these ways, such as federal matching grants for municipal waste treatment, are not relevant for electric power generation. Others, such as loan guarantees for small business, touch only a small part of the electricity industry. To the extent that pollution control subsidies are important for electric utilities, these subsidies mostly take the form of tax preferences. Tax preferences give rise to "tax expenditures", or revenue losses to the United States Treasury while enhancing the revenue of the affected companies.<sup>57</sup> In all cases, tax preferences for pollution are available to unregulated as well as regulated (economically regulated) industries. These tax preferences take three forms: industrial development bonds,<sup>58</sup> investment tax credits,<sup>59</sup> and the accelerated cost recovery system.<sup>60</sup> Each of these tax preferences will be discussed separately.

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<sup>53</sup> See *supra* text accompanying notes 3-4.

<sup>54</sup> See *supra* text accompanying notes 11-13.

<sup>55</sup> See *supra* text accompanying notes 32-33.

<sup>56</sup> See *supra* text accompanying notes 41-51.

<sup>57</sup> The Congressional Budget Act of 1974 requires that the Treasury estimate such losses, Pub. L. 93-344 § 601, 88 Stat. 297, 323 (codified as amended at 31 U.S.C. § 1105(a)(16) (1982), on the ground that there is no essential difference between an explicit grant and the foregoing of tax revenue for the same purpose. The estimates are subject to some conceptual and measurement problems in practical application, but nevertheless estimates of tax expenditures, to the extent available, give us a basis on which to judge the relative importance of this form of subsidy.

<sup>58</sup> I.R.C. § 103(b) (1982 & Supp. 1985). The requirements of tax exempt obligations used to finance activities other than general governmental activities are severely restricted under The Tax Reform Act of 1986. Pub. L. 99-514 § 1301, 1986 U.S. CODE & ADMIN. NEWS-SPECIAL TAX PAMPHLET (100 Stat.) 518, 2 Fed. Taxes (p. 17) ¶ 8100.04 (Oct. 23, 1986). The analysis to follow is therefore largely of historic significance.

<sup>59</sup> I.R.C. §§ 38, 46-48 (1982 & Supp. 1985). The investment tax credit is repealed by the Tax Reform Act of 1986, Pub. L. 99-514 § 211, 1986 U.S. CODE & ADMIN. NEWS-SPECIAL TAX PAMPHLET (100 Stat.) 82, for property placed in service after December 31, 1985, except for property covered by transitional rules, certain qualified progress expenditures and a select portion of timber property. The analysis to follow is therefore of historic significance only.

<sup>60</sup> I.R.C. § 168 (1982 & Supp. 1985). The accelerated cost recovery system (ACRS) is somewhat modified by the Tax Reform Act of 1986 for property placed in service after December 31, 1986. Pub. L. 99-514 § 201, 1986 U.S. CODE & ADMIN. NEWS-SPECIAL TAX

### A. *Industrial Development Bonds*

State and local governments issue industrial development bonds (IDB's) for private purposes. For over a decade, state and local governments have been turning to IDB's to promote selected private sector activities, including local economic development. As with state and local bonds in general, interest payments are exempt from federal taxation.<sup>61</sup> The special feature of IDB's is that the proceeds of the bonds are used for the direct benefit of private businesses, organizations or individuals. From 1975 to 1983, the total volume of long-term, tax-exempt bonds issued by state and local governments tripled, from approximately \$30 billion to \$93.3 billion. During the same period, the private-purpose component of these totals increased six fold, from slightly below \$10 billion to \$59.4 billion.<sup>62</sup> Thus, approximately 64 percent of all state and local long-term bond issues were for private purposes by 1983. Of the \$59.4 billion private issue, approximately \$40 billion were for IDB's and the leading single purpose among the latter was pollution control with \$11.8 billion.<sup>63</sup> The corresponding tax expenditures for pollution control bonds of over 1 year life were estimated at approximately \$1 billion in 1983.<sup>64</sup> In addition, state corporate income tax laws often allow credits against corporate income taxes to firms making pollution control expenditures.<sup>65</sup> And local property taxation often exempts from assessed valuation of utilities the amounts represented by investment in pollution control facilities.<sup>66</sup>

### B. *ACRS and ITC*

The Accelerated Cost Recovery System (ACRS), introduced by the Economic Recovery Tax Act of 1981,<sup>67</sup> is an alternative to pre-existing accelerated depreciation. In combination with the Investment Tax Credit (ITC),<sup>68</sup> ACRS offers such great advantages to the

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PAMPHLET (100 Stat.) 37. The modifications retain many of the original ACRS features. The only kind of investment for which a substantial change is made is real estate.

<sup>61</sup> I.R.C. § 103(b) (1982 & Supp. 1985).

<sup>62</sup> Clark & Neubig, *Private Activity Tax-Exempt Bonds, 1983*, 4 STATISTICS OF INCOME BULL., 97-98, 103 (1984).

<sup>63</sup> *Id.* (Table 1).

<sup>64</sup> U.S. Treasury, SPECIAL ANALYSES: BUDGET OF THE UNITED STATES GOVERNMENT, FISCAL YEAR 1985, G-44 (Table G-1).

<sup>65</sup> [All States Statutes Summaries] State Tax Guide 664 (July 1986).

<sup>66</sup> *Id.*

<sup>67</sup> Pub. L. 97-34 § 201, 95 STAT. 203 (1981).

<sup>68</sup> I.R.C. §§ 38, 46-48 (1982 & Supp. 1985), *repealed by* Pub. L. 99-514 § 211, 1986 U.S. CODE & ADMIN. NEWS-SPECIAL TAX PAMPHLET (100 Stat.) 32.

taxpayer that it has almost completely eclipsed pre-existing accelerated depreciation.

The annual write-off of ACRS property is determined by applying a statutory percentage from IRS tables to the basis of the asset.<sup>69</sup> Accelerated depreciation is built into the tables. Congress has assigned pollution control equipment a 5 year life, regardless of its expected true life.<sup>70</sup> In both the assigned 5 year life and the built-in schedule of accelerated amortization, there is a tax preference. Both ITC and ACRS can apply to the same investment, though the amount of the investment that is depreciable, referred to as "basis," is reduced slightly by the investment tax credit.<sup>71</sup>

There are no estimates of the tax expenditure effects of ACRS. It is so widely applicable that it is defined as a norm from which tax expenditures are calculated. There are tax expenditure estimates available for the investment tax credit which apply to the entire economy. From these a very rough, order-of-magnitude estimate can be made as follows for pollution control. The Treasury estimated the aggregate tax expenditures for the investment credit in 1984 at \$21.715 billion (the sum of \$1.43 and \$20.285 billion, for cases with and without employee stock ownership plans, respectively).<sup>72</sup> Now, simply pro-rate these investment credit tax expenditures according to the ratio of total non-farm investment in pollution control plant and equipment to total non-farm business plant and equipment expenditure in the nation in 1984. This ratio is 2.22 percent on the basis of planned expenditures, and was 2.39 percent in 1983 on the basis of realized expenditures.<sup>73</sup> Using a value of 2.3 percent gives approximately \$500 million for the tax expenditure due to the investment credit on pollution control facilities. This estimate is surely high because pollution control facilities benefit much more than other non-farm business plant and equipment from the use of IDB's. Where IDB's are used, 5 percent rather than 10 percent investment tax credit applies.<sup>74</sup> Considering this fact, a low tax expenditure estimate (which probably brackets the correct number) would be half as much, or \$250 million.

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<sup>69</sup> 3 Fed. Taxes (P-H) ¶¶ 15,001 (1986).

<sup>70</sup> I.R.C. § 169(a) (1982).

<sup>71</sup> I.R.C. § 291(a)(5) (Supp. 1985).

<sup>72</sup> U.S. TREASURY, SPECIAL ANALYSES: BUDGET OF THE UNITED STATES GOVERNMENT, FISCAL YEAR, 1986, Table G-2.

<sup>73</sup> Ratios were calculated using Russo & Rutledge, *supra* note 52, for pollution control investments, and Seskin & Sullivan, *Revised Estimates of New Plant and Equipment Expenditures in the United States, 1947-1983*, 65 SURVEY OF CURRENT BUSINESS 16 (1985) for total business plant and equipment expenditures.

<sup>74</sup> I.R.C. § 46(c)(5)(B) (1982).

Again, all three tax preferences, IDB's, ITC, and ACRS, can be applied simultaneously. The results are not additive, but clearly are more preferential than any two alone would be, and the combination does more for pollution control than for industrial plant and equipment in general.

One of the consequences of these subsidy policies is to reduce the efficiency with which pollution is abated. Apart from the *a priori* expectation that beneficiaries will not exercise the same vigilance in cost control with subsidized as with unsubsidized expenditures, there are more fundamental allocational inefficiencies. Because pollution control tax preferences apply only to identifiable pieces of equipment, they introduce a bias toward end-of-the-pipe technologies, as opposed to in-process technologies. The former assume the creation of pollution and then attempt to deal with the removal of pollution; the latter reduce the generation of pollution during production activity. An example of an end-of-the-pipe technology would be a stack gas scrubber. An example of an in-process technology would be a method of fuel preparation that increases heat recovery, leading to less stack gas per unit of heat generated. The distinction is relevant here because it accounts for the difference between investments that are relatively more subsidized (the separable, end-of-the-pipe investments) from those which are not (the inseparable, in-process investments). Without the special tax preferences for pollution control equipment, the relative importance of in-process (inseparable) investments would increase and the overall cost to society of pollution control would be reduced.

A third inefficiency resulting from tax preferences is the bias toward capital-intensive technologies that is inherent in the subsidizing of capital but not operating expenses. Once again, the subsidy of some and not of other kinds of pollution control technologies biases the choice made by the polluter and thereby obstructs the selection of least-cost methods of pollution control.<sup>75</sup>

### *C. Regulatory Accounting*

Most regulatory commissions, state and federal, make accounting provisions to assure that the aforesaid tax preferences result in earnings to the utility rather than rate reductions to the public. This

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<sup>75</sup> It is interesting to note that the two allocational biases (between (1) separable and nonseparable technologies and (2) capital and noncapital inputs) arise out of efforts to assure cost control and prevent fraud, our first form of inefficiency. Expenditures for separable pieces of equipment can be audited. Nonseparable expenditures and those for noncapital inputs are more difficult to audit.



was clearly the intent of the tax preferences and, like it or not, the commissions are engaged in carrying out what is essentially a legislative policy—the policy of subsidizing pollution control.

By 1985 approximately 40 state commissions prescribed normalization accounting of ITC preferences by their utilities and more than that number allowed such treatment.<sup>76</sup> The term “normalization” as used here means that the tax benefit is not passed on to consumers immediately but is amortized over time on a straight line basis. Between the time that a tax benefit is received and the time consumers are benefitted by it, the utility has the use of the revenue. In addition to allowing normalization accounting of ITC preferences, approximately 49 state commissions allow accelerated depreciation; 42 of these specifically permit rapid amortization of pollution control facilities.<sup>77</sup> The Economic Recovery Tax Act of 1981<sup>78</sup> prohibits state regulatory commissions from attempting to capture these tax benefits for consumers in the year in which they are earned.<sup>79</sup> Consistent with this requirement, state commissions normalize ACRS benefits as well.

The whole process can create an unfortunate dynamic; in order to make up for the costs of current excess capacity, it is necessary to invest in more capacity. Otherwise, the favorable earning effects of ACRS and ITC will vanish and, in fact, be replaced by adverse effects late in the life of the investments, when the normalized benefits to consumers exceed the earnings benefits to the utility.

The following numbers are indicative of the value of the workings of the investment tax credit and the accelerated depreciation provisions of the federal tax laws. For electric utility company use of ITC and accelerated depreciation tax preferences during the 1950's and 1960's for all types of investment, the estimated tax revenue losses ran about half a billion dollars annually.<sup>80</sup> They grew rapidly in the 1970's and exceeded \$4.3 billion annually by the end of the decade.<sup>81</sup> Cash flow benefits deriving to the electric utilities, which were about \$150 million annually in the late 1950's, amounted to some \$2.3 billion in 1978.<sup>82</sup> These figures suggest that the prefer-

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<sup>76</sup> 1984 *Annual Report on Utility and Carrier Regulation*, *supra* note 14, at 569 (Table 47).

<sup>77</sup> *Id.*

<sup>78</sup> Pub. L. No. 97-34, 95 Stat. 172 (1981).

<sup>79</sup> 1984 *Annual Report on Utility and Carrier Regulation*, *supra* note 14, at 568.

<sup>80</sup> Kiefer, *The Diminishing Federal Income Tax Burden of the Public Utilities: Measurement and Analysis*, 33 NAT'L TAX J. 393, 399 (1980).

<sup>81</sup> *Id.*

<sup>82</sup> *Id.* at 399, 401.

ential treatment in regulatory accounting of tax subsidies helped promote a surge in construction of unneeded electric capacity, some of which turned out to be excess of actual demand.

Partly as a result of the disproportionate share of pollution control investments in the electric utility industry,<sup>83</sup> the electric utility industry has benefitted more than the corporate sector generally from these tax provisions. The average income tax liabilities for both were about the same during the mid-1950's. Beginning in 1964 and continuing to the end of the 1970's, the effective tax rate of the electric utilities declined to one-fifth the average of the whole corporate sector.<sup>84</sup> Three kinds of inefficiencies resulted in the process: (1) cost control problems; (2) misallocation between separable and nonseparable capital investments; and (3) misallocation between capital investments and other inputs.

What might be done about those problems? The single most important measure would be to eliminate the subsidies. If polluters were free to abate in whatever way they found most economical, they would master their own cost control problems, they would choose between end-of-the-pipe and in-process technologies on a least-cost bases, and they would balance expenditures among all inputs on the same least-cost basis. All of these objectives would be served by imposing on utilities an emissions charge per unit of pollution released into the environment. At the same time enforcement problems would be greatly reduced.<sup>85</sup>

In the broader context of this analysis, tax policy for pollution control is like CWIP for pollution control. Both give the financial advantages to electric utilities if they install pollution control devices. The implication is that contemporary social regulation would otherwise be unable to do the job. We believe this to be the case. Our remedy is to bring more economics into the social regulation process. In the electric utility industry, this means coordinating economic and social regulation.

## VI. TOWARD COORDINATING ECONOMIC AND SOCIAL REGULATION

Our focus has been on only one kind of social regulation—environmental—and one industry—electric utilities—subject to economic regulation. But the principles are illustrative and have broad signif-

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<sup>83</sup> See Russo, *supra* note 52.

<sup>84</sup> Kiefer, *supra* note 80, at 399.

<sup>85</sup> See ANDERSON, *supra* note 13.

icance. The administrative challenges of coordination at the local level and the overriding priority given to the new (social) regulation arise from a common cause; the imposition of social measures (often absolutes) with very little recognition of the nature of the economic context in which the problems arise.

In our national policy innocence, we legislate social goals as though they are unrelated to economic considerations and, in our administrative practice, compromise these social goals according to happenstance. This is hardly integration. There is no such thing as an absolute (a goal pursued without reference to cost) in economics and very little recognition of a relative (the need for trade-off) in social policy. The inherent incompatibility of our current brand of social regulation with economizing has led to a number of inefficiencies that are made worse by subsidy. The latter is brought in for want of success in achieving social goals by command and control. The situation is illustrated especially at the interface of economic and social regulation, but our examples extend also to other parts of the economy.

If coordination of economizing and social goals is to be achieved, economic and social regulation must be more overtly reconciled. Because economic criteria are more explicit than social criteria and economic regulation has evolved over a longer period of time than social regulation, this regulatory system may be used as the matrix for institution-building, at least for the purpose of developing a model and not with any implied endorsement of particular administrative bodies. The simplest case is the one we have reviewed herein: environmental regulation of electric utilities.

Economic regulation is intended to take the place of the market, not the place of management. Economic regulation controls prices, conditions of service, profits, and only as much internal operation of the regulated firm, such as the system of accounts, as is necessary to make effective its control of profits. Economic regulation does not attempt to prescribe technologies. There are plenty of problems in doing what economic regulation seeks to do. Those problems pale, however, in comparison with the problems of successfully operating an economic system by public prescription of technologies, as shown by the Delaware Estuary example.

Rather than attempt to prescribe technologies, a more promising approach for social regulation is to guide behavior in the private sector by a system of financial penalties for performance (or lack of performance). A familiar basis for financial penalties is public damages. The erstwhile polluter faced with financial penalties has the

incentive to find its own way to control pollution. There is no need for, and much to lose from, prescribing the technology a firm shall use. But there is a need for comprehensive, accurate, continuous monitoring of pollution output, which is presently lacking.<sup>86</sup>

If environmental regulation were directed toward setting financial penalties, then integration with economic regulation could follow naturally. The electric utility sector operates in an institutional and regulatory structure of long standing that is conducive to handling new regulatory requirements imposed from outside. The process for doing so is established and certain. Detailed accounting arrangements exist for accommodating the investments and expenses associated with pollution control facilities. The electric utility sector seems to be ideal for what can be described as the conversion of social cost functions—the negative externalities of environmental degradation historically paid for by the public in the form of pollution damages—to private cost functions paid for by utility companies.

Taken one step further, the new (social) regulatory requirements need not be introduced after the fact, but should evolve in the course of economic regulation. Rate hearings before the economic regulators would be an occasion for considering the interests of the pollution-victimized public. The environmental regulators would be advocates for this party. Already many parties with many points of view express their interest in utility rates in this forum. Low income rate-payers and their advocates argue for life-line rates, inverted rate structures, credit under dire financial circumstances, and other considerations. Governments speak in favor of promotional rates to new industry, and so on. In the model envisioned here, environmental regulators would estimate public damages from pollution. A lot is already known about the measurement of such damages.<sup>87</sup> Much more can be learned in the process of hearings. It is more in keeping with the traditional talents of a public body to determine public damages, based in part on economic input, than to prescribe what technologies are appropriate for the private sector. With this system, one expects that the social regulatory job would be accomplished much more effectively.

The interest of pollution control would then be served by assessing public damages, along with other costs, against the electric utility and hence including public damages in rates to be paid by power

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<sup>86</sup> For a description of the status of monitoring, see L. LAVE & G. OMEN, *CLEARING THE AIR: REFORMING THE CLEAN AIR ACT* 19–23, 42, 46 (1981).

<sup>87</sup> See A. FREEMAN, *THE BENEFITS OF AIR AND WATER POLLUTION CONTROL* (1979).

consumers. Provision should be made for continuous adjustment of such assessments in accordance with pollution output. The polluter's profit maximization would be achieved by curtailing pollution as long as the public damages exceeded the costs of control. Finally, this system would provide continuing incentive to find better ways of controlling pollution.<sup>88</sup>

This concept incorporates the rationale of emissions charges with (1) the expertise that should be built into environmental regulation and (2) the institutional context of rate setting that is integral to public utility regulation. The concept is well suited for pollution control in electric utilities. Whether the same concept can be extended to other industries is a further question, but answers are more likely to evolve if we take the first step—introduce it in industries subject to economic regulation.

## VII. CONCLUSION

Economic regulation and social regulation offer contrasting patterns in origin, purpose, and effect. They interface in the electric utility industry, especially in the control of air pollution and costs arising therefrom. The result has been a suppression of the public interest in rate control for the sake of pollution control. This is not to say that we are succeeding at pollution control but only that the needs of the latter are conceived in such a way as to override those of rate control.

Social regulation (pollution control in this study) is perceived as an absolute and is compromised according to no consistent logic. The compromising comes about as a result of the inherent unenforceability of the command-and-control system employed generally for pollution control. Economic regulation treats the results of social regulation as data in determining costs for the purpose of setting electric power rates. Economic regulation also goes further to smooth the path for the adoption of pollution control investments by giving them preferential treatment in a new (since 1976) widespread acceptance of construction work in progress (CWIP) as a part of the rate base. The same preferential treatment of pollution control investments occurs in national tax policy, which especially impacts electric utilities and hence cost control in electric power regulation.

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<sup>88</sup> Consistent with the logic of economic theory, the revenue from such assessments should go to the public treasury. It should not go to compensate victims. For a standard textbook exposition, see P. BURROWS, *THE ECONOMIC THEORY OF POLLUTION CONTROL* 98-107 (1980).

Some glimmers of a cost-effective approach to pollution control are apparent in the use by social regulators of offsets, bubbles, and ERC's. These instruments, in principle, at least, permit greater economic efficiency. Despite the promise of greater efficiency and the significance of offsets, bubbles, and ERC's for cost control, economic regulatory commissions have not been involved in their development.

This article proposes an approach toward alleviating the several difficulties noted above. The approach would combine economic and social regulation, and therefore introduce cost considerations into social regulation. This approach would (1) bring greater efficiency to pollution control and (2) place the decision on the extent of pollution control in a public forum, where the trade-off between costs and benefits could be explicitly considered. A corollary advantage would be to strengthen economic regulation to the extent that it has been compromised by existing pollution control policy. Moreover, this approach might provide insights into the extent to which pollution control policy in general can be made more flexible and more effective elsewhere in the economy.