INTERIM REPORT TO THE 117TH MAINE LEGISLATURE JOINT STANDING COMMITTEE ON UTILITIES

Progress of the Study Group on Energy and the Environment
Established Pursuant to P&S Law 1993, Chapter 80

Prepared and Submitted by the
Maine Public Utilities Commission
January 1, 1995

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I. Work to be Accomplished by the Study Group on Energy and the Environment.

P&S Law 1993, Chapter 80, *An Act to Establish a Study Group on Energy and the Environment*, creates a study group constituted by the Chairman of the Public Utilities Commission (PUC), the Director of the State Planning Office (SPO), and the Commissioner of Environmental Protection (DEP). (P&S Law 1993, Chapter 80, is provided as Attachment A.) It charges the Study Group with four duties, as well as an interim progress report (January 1, 1995), and a final report (January 1, 1996).

The first duty is to create at the PUC a comprehensive library of environmental externalities literature, including a file containing available summaries of this literature. The Library will also contain information about the locations in the literature where methods are provided for evaluating the relative magnitude of different externalities.

This first task has been undertaken by the PUC working alone, specifically by Diane Friese, PUC Librarian, and Eric VonMagnus, Technical Analyst. The Group has made considerable progress to date, as will be detailed in section III of this report.

The second duty is to identify and summarize the state and federal environmental regulations and policies that affect the price of energy resources in Maine, and to quantify, as far as possible, the price effects of environmental compliance. The Law provides a list of energy resources (see below).

The third duty is to identify environmental impacts that are not reflected in current pricing (ie, externalities).

The second and third tasks are being carried out by members of a staff working group from the three agencies. Responsibility for obtaining the required information for each single energy resource is assigned to a staff person from SPO or the PUC. Four DEP staff persons, one from each bureau (Administration, Brooke Barnes; Air Quality, John Chandler; Hazardous Materials and Solid Waste, John James; and Land and Water Quality, Hetty Richardson), have been named contact people to assist those responsible for a resource in identifying applicable regulation and significant externalities. In addition, people from CMP will be performing research in support of this project.

Assignments of responsibility for energy resources specified in the Law are as follows:

Natural Gas	- Denis Bergeron (PUC)
Coal	- PUC staff
Nuclear	- Uldis Vanags (SPO), with assistance of CMP
Hydro	- Betsy Elder (SPO)
Wind	- Sharon Reishus (PUC)
Demand Side Management	- Denis Bergeron (PUC)
Biomass	- Jim Connors (SPO)
Waste to Energy	- CMP and DEP
Petroleum Products	- Eric VonMagnus (PUC)

Sections for the final report accomplishing the second and third tasks for each energy resource (summarizing applicable regulation, quantifying price impacts, and identifying significant externalities) will be complete and ready for consideration by the Study Group by September 1995.

The fourth duty is to recommend preferred methods for taking externalities into account in energy decision-making.

This fourth task will be undertaken in two stages. First, at the PUC, Denis Bergeron and Eric VonMagnus will draft a menu describing the available methods, and the pros and cons of each. This menu will be completed and ready for consideration by the Study Group by

September 1995. Second, the Study Group may then make specific recommendations for methods of externality consideration, if any, that it finds appropriate to address priority environmental concerns, as identified in research on externalities associated with the various energy resources.

The Interim Report was written at the PUC, primarily by Eric VonMagnus, with comments from the Study Group and the members of the staff working group, and with the secretarial assistance of Jean Abbott (PUC).

The Final Report will be assembled at the PUC, and will include: background information, similar to that in the second section of this report; a description of the library; the sections for each energy resource, providing the information concerning environmental regulation, price impacts, and externalities that is required by the Law; recommendations concerning methods for externality consideration in policy and planning; and recommendations from the Study Group for legislation, if any.

II. Background: Energy and Environmental Externalities Policy in Maine.

In 1991 the Legislature established a Commission on Comprehensive Energy Planning. This Commission issued a Final Report in May of 1992, which for the first time explicitly includes issues related to environmental impacts in the development of Maine's energy planning and policy. The Report recognizes that the use of energy resources is fundamentally important to the Maine environment, and provides a number of objectives and recommendations that aim at the achievement of a "sustainable energy future," which protects human health and the environment while promoting economic prosperity. The Report recommended in particular that Maine should establish a broad-based advisory group on energy and the environment to evaluate strategies for including externalities in energy decision-making.

Environmental externalities can be understood as resource costs in the form of damages to the environment and human health associated with various production and consumption activities - including the use of energy resources - where these costs are not reflected in the prices paid by consumers. For example, the burning of fossil fuels leads to air

crops, buildings, human health, and so on. In many instances the costs of such damages are not adequately included in the prices paid in connection with using fossil fuels. The result will be that prices understate the full costs to society of fossil fuel consumption. In particular, fuel prices do not provide incentives to avoid causing environmental damages, since the immediate out-of-pocket cost to consumers of externalities is (by definition) zero. Under such conditions resources are used wastefully. For that reason many economists hold that a method should be found to include externalities costs in prices and to consider them in public policy, as was recommended for energy decision-making by the Commission on Comprehensive Energy Planning. The expected result from the economist's perspective would be reduced environmental degradation, improved health, and increased overall economic efficiency. Another expected result would be changes in the relative prices and market shares of the various energy resources. For this reason, and a number of others including the complexity of the externality valuation process, externality policy is very controversial.

In recent years environmental externalities associated with the generation of electricity have attracted a great deal of attention (and have provoked much disagreement) among regulators and policy makers. Many studies have been conducted in an effort to develop appropriate

tion of electric utility systems. Quite a few state public utility commissions have adopted procedures for doing so.[1]

In Maine, externality consideration in electric resource planning has been an issue raised from time to time in the Legislature since 1988. In 1990, L.D. 2029 would have required the Maine Public Utilities Commission (MPUC) to consider the environmental impacts of utility services. An amended version of L.D. 2029 was passed directing the MPUC to "undertake analysis of the extent to which environmental and economic impacts of alternative energy resource plans should be included in the electric energy planning process subject to the Commission's jurisdiction."

On May 1, 1991, the MPUC submitted a majority report on "Environmental and Economic Impacts" to the Utilities Committee. The report concluded that additional study concerning methods for quantifying and valuing externalities and for taking them into account in planning was needed before externality consideration should be implemented in Maine. The need for externality consideration in the short term was

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[1] Niemi, E., et al, Environmental Externalities and Electric Regulation. National Association of Regulatory Utility Commissioners (NARUC), 1993.

Rose, K., et al, Public Utility Commission Treatment of Environmental Externalities. National Regulatory Research Institute (NRRI), 1994.

acquired, and any such choices made would very likely be of environmentally beneficial resources. In the longer term, the Commission should continue to examine externality issues, since "externality value approaches may offer significant advantages over traditional techniques of environmental management."

The MPUC Chairman was a member of the Commission on Comprehensive Energy Planning and contributed to its May 1992 Report (mentioned above). The Report expressed unanimous support for addressing the environmental effects of energy production as a fundamental policy objective. It also stated that it is "not so much a matter of whether, but of when and how" externalities consideration will become part of Maine's least-cost planning process. It also noted that some of the difficulties in addressing externalities result from differences in the degree to which environmental costs are reflected in the prices of various energy resources, particularly utility vs. non-utility. The fact that the Commission endorsed externality consideration in energy policy decisions, but was unable to recommend a method, led to its recommendation concerning the creation of an advisory group to study such issues further. The Report indicated that the study should "look at all types of energy use across all energy use sectors" in order to "avoid unwanted cross-over effects."

address externality issues. Among these, L.D. 356 sought to establish the Advisory Council recommended by the Commission on Comprehensive Energy Planning. In 1994 an amended version of L.D. 356 passed - P&S Law 1993, Chapter 80 - establishing a body of this nature, the Study Group on Energy and The Environment, which is issuing this Interim Report. The Group is made up of the Chairman of the MPUC, the Commissioner of the Department of Environmental Protection (DEP), and the Director of the State Planning Office (SPO). A staff working group from these three agencies has been assembled to carry out the mandates of P&S Law 1993, Chapter 80, as explained in the preceding section.

III. Externalities Library: Progress to Date.

The externalities library will include materials in at least the following areas:

- the economic theory of externalities and environmental policy;
- the methodology of economic valuation of environmental resources;
- proposed methods for considering environmental externalities in electricity planning, and in other areas of planning and policy;
- studies attempting to describe quantitatively the environmental impacts of energy production and use;
- studies attempting to determine appropriate economic values for specific externality damages;
- studies of the methods of externality consideration used in other states;
- important examples of policy recommendations concerning energy and the environment.

The library will also include environmental regulations (with all of Maine's rules in current form) and official status or otherwise reliable summaries of this regulation. It will contain a file of summaries of methods of externalities assessment, as required by the L.D. (These summaries have been located, but the file has not yet been created).

There will also be a file of existing bibliographies on environmental externalities, which will facilitate the use of interlibrary loan to access titles not in our collection.

Titles in the Study Group collection are being designated EESGL (environmental externalities study group library) in the PUC library's computerized catalog system. A complete print-out of titles in the collection can be made at any time, organized by author, title, or subject, as preferred. About 100 titles already on hand have been designated EESGL, and about 40 more are being acquired at this time. More titles will be acquired during 1995, in part based on recommendations by the staff working group concerning material that they discover during the course of their research.

In addition to the designated collection, the PUC library has extensive collections of titles in other areas of interest to the Study Group. These include EMF (electro-magnetic fields), the Clean Air Act, energy efficiency, integrated resource planning, energy industry operations, and handbooks of energy industry data and government data sources.

IV. Research on the Environmental Regulation of Energy Resources.

As explained in section I, individuals in the staff working group have been assigned responsibility for each of the energy resources listed in the Law. They will each write a section for the final report on their specific resource, providing the information about it required by the Law. The deadline for completion of these sections will be September 1, 1995.

The wording of P&S Law 1993, Chapter 80 and of the Report of the Commission on Comprehensive Energy Planning indicate that this research is to consider what is sometimes referred to as the full fuel cycle for each energy resource: "environmental impacts, resulting from the extraction, production, transmission, consumption ..... of energy".

If we consider fossil fuels, for example, there is exploration, extraction using mines or wells, processing, transportation or transmission, storage, combustion use of the fuel, and waste disposal. Sometimes facility construction and decommissioning is also important. For some resources, for example hydro-electric generation, the picture is somewhat different, but it is still appropriate to consider the entire process.

At each stage in the overall energy resource production and consumption process there are environmental impacts, often a great many of them. It is also likely that there will be federal and state environmental regulation of many kinds applicable to the cycle at every stage. Compliance with environmental laws will have a cost and a corresponding price impact, probably at every stage. In principle, there could be significant environmental externalities at any stage. The second and third duties, if carried out in complete detail, would involve obtaining a large amount of information about each resource at each stage of its fuel cycle, including information about applicable environmental regulation, its price effects, and any remaining externalities. Fortunately much work on these matters has already been completed, but even attempting to locate it and access it presents a considerable challenge to our staff working group.

As a first step, the responsible staff person will write a detailed narrative description of the fuel cycle for his/her energy resource. This will become a structure into which information about regulation, environmental impacts, price impacts, and externalities is placed, once it is located. These fuel cycle descriptions were to be completed by December 1, 1994. They were to be accompanied by a statement con-

cerning how and where the needed information will be obtained. As of this date this work has been completed with respect to all of the energy resources.

Over the remaining eight months until September 1, 1995, the information will be obtained to the extent reasonably possible, and a section carrying out the second and third duties will be created for each energy resource. These will be assembled at the PUC into a chapter for the final report, which will be made available to the Study Group for consideration in forming its recommendations concerning methods for externality consideration and for legislation (if any).

V. Concepts of Externality Consideration.

P & S Law 1993, Chapter 80 asks the Study Group to locate "methods of evaluating the relative magnitude of different externalities," and to recommend preferred "methods of accounting for the costs to society and the environment of environmental externalities. " We will refer to these activities as externality assessment and externality consideration, respectively.

This section will provide a brief informal introduction to the basic problems and methods in externality assessment and consideration. For convenience, a familiar example will be used, the coal energy resource, looking only at air emissions in the combustion stage of its fuel cycle. Facts will be cited without documentation and are for purposes of illustration only. [2]

A. Externality Assessment

What would have to be done in order to assess the magnitude of any externalities due to air emissions? Externalities assessment can be

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[2] Facts cited for illustration are documented in the New York State Environmental Externalities Cost Study, Report 1, 1993.

viewed as having three steps: first, scientific description of damages, tracing and verifying causal pathways leading from emission to damage, and measurement of such damage in physical terms; second, economic valuation of the damage (placing a $ value on it); third, externality determination, determining the degree (if any) to which damage costs are reflected in prices.

Scientific description is a multi-disciplinary endeavor. It would begin with an attempt to identify air emissions from coal combustion, which would involve chemical and engineering studies of what goes into the combustor and what comes out. The next step would be determining what happens to emissions once they enter the atmosphere. Here chemistry, physics, climatology, and meteorology would be prominent. Next it must be determined what happens to non-living and living things near the earth's surface when they come in contact and interact with the atmospheric effects of emissions. Effects on non-living things would be studied by chemists, physicists, engineers, geographers, and others. Effects on living things would be studied by biologists, ecologists, biochemists, geneticists, toxicologists, epidemiologists, and others.

oxides of nitrogen (NOx), carbon dioxide (CO2), particulates, mercury, and a great many other substances.

Atmospheric scientists and climatologists have found that SO2 emissions result in acid rain; that NOx reacts in sunlight with other chemicals to form ozone; and that CO2 accumulation can reduce the rate of global cooling, which could in turn destabilize the world climate, with somewhat unpredictable but potentially devastating effects of many kinds. These atmospheric and climatological phenomena are very complex and may not be entirely understood.

Epidemiologists have found relationships between exposure to particulates and elevated levels of mortality and chronic respiratory diseases. They have found relationships between exposure to gaseous SO2 and asthma symptoms. They have found that exposure to ozone is associated with minor and acute respiratory illness and with increased risk of premature mortality.

Biologists have learned that acid rain can alter the chemistry of streams and lakes, changing them ecologically and harming animals and plants, perhaps resulting in loss of habitat and species extinction in

and streams, accumulating in the fish that inhabit them, and causing severe health problems to humans who ingest too much mercury by eating these fish.

Gaseous SO2, NOx, and ozone can all cause reduced crop yields. Acid rain also can cause damage to metal and stone, including historic structures. Particulates and other air pollutants can cause loss of visibility and aesthetic degradation of urban and recreational areas (such as the Grand Canyon).

This unsystematic tour has taken us from five pollutants, through a dozen or so sciences, to an almost bewildering variety of damages. These include:

1. damages to crops and buildings
2. loss of a traditional food source (fresh water fish)
3. damages to cultural treasures (sculpture, public buildings)
4. illness
5. premature death
6. toxic contamination of water resources
7. altered habitat and species loss
8. loss of visual aesthetic enjoyment of nature.

In principle, the various sciences can verify the causal pathways from some emission to various kinds of damage, and they can measure in physical terms the extent of damage resulting from such and such a

work already done, but also an incredibly large job yet to be completed. From the point of view of a policy maker, scientific description of environmental damages will often be uncertain and controversial. Our knowledge in this area is already very great, but it is also incomplete, and certain to remain so, because the same process of scientific inquiry that answers today's questions creates tomorrow's.

Given scientific data on damages, the second step in externality assessment is economic valuation of the damages. Any attempt to achieve consensus on these calculations, however, is likely to be daunting in light of the complexity of the effects.

Valuation methods essentially rely on the economist's theory of consumer behavior. Consumers make choices, based on their values or preferences, from which their dollar valuation of various alternatives can be determined, either by direct observation or by inference. The easiest case is direct observation of market prices that consumers are willing to pay. If Jones will pay $15 for a ticket to a concert, then attending the concert is worth (at least) $15 dollars to him. The prices established in competitive markets can reasonably be used to value some damages, for example to crops and buildings, above. Using the same procedure to value the loss of a traditional food source is possi-

left out. Market prices for medical care and lost wages might also be used to value illness. Here, many would hold that this method ignores things that are important, such as discomfort and lasting bodily harm. There are markets, however, for labor in risky occupations and for insurance against accident claims in which there are prices that have relevance to the value of discomfort and bodily harm. Examples can be found where individuals have been explicitly willing to accept discomfort and bodily harm in voluntary exchange for money. Examples are common where individuals have been willing to accept an increased risk of death in voluntary exchange for money. This data can be used to calculate an implicit dollar valuation of their lives. Used with ingenuity and grounded in economic theory, direct observation of market prices and of voluntary exchanges for money can lead to fairly reasonable economic valuations of a surprisingly broad range of damages.

One might also be able to set up an artificial market in which it could be directly observed how much people would be willing to pay for something that no market yet exists for. For example, researchers have made cash offers to buy hunting licenses in an attempt to value the right to hunt. [3]

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[3] New York State Environmental Externalities Cost Study, Report 1, p. B2-2)

based on indirect observation of choices made where no money exchange is involved. If some item is chosen over another, one can infer that the chooser values it at least as highly. If we know a dollar value for the item not chosen we have a good start. For example, Jones may drive three hours to get a better view, less smog. He preferred the better view to the time and money spent driving. These can be valued using market prices, and then a plausible inference can be made about the dollar value of the reduced aesthetic enjoyment at the smoggy site not visited. With ingenuity, the economic theory of choice can be used to indirectly infer values for damages not valued in markets. What is needed is some choice or preference relationship to another item that can be more easily valued. (This method might work for cultural treasures.)

Besides the direct and indirect observation methods, there is another approach to valuation, known as contingent valuation, that uses survey techniques. Hypothetical questions are asked in the form, "What would you be willing to pay for ...?" or "Which do you prefer ...?" Assuming the respondent knows her preferences, she should be able to tell us what she would pay, or what she would choose, in hypothetical situations. In theory, this is an alternative method to observing actual choices for identifying an economic agent's preference and valuation

thetical questions really are conceptualized by the respondent in a manner that brings into play/conflict the same preferences that a real choice situation would activate. Answers to survey questions have sometimes seemed to vary with how a question is put. There are many practical difficulties in designing valid and reliable contingent valuation studies. Many practitioners believe, nonetheless, that carefully done contingent valuations can be useful. Hypothetical models may provide the only available method for some types of damage.

As we have seen, there is a considerable body of methodology based in economic theory that can be used to place a dollar value on environmental and health damages. Some valuations are quite plausible. Others make assumptions that are not entirely convincing, or at least do not seem so to everyone. For that reason, the second step in externality assessment is also (like the first) sometimes controversial and plagued by scientific uncertainties.

Let us assume that the first two steps have been completed successfully: we have a scientific description and measurement of damages (1,000 tons of lost crops, three cancer deaths, etc), and a dollar valuation as well (crop damage, $1,000,000; mortality, $12,000,000). What remains to be done in the process of externality assessment?

Externality determination is necessary because the externality concept is not a synonym for environmental damage. A damage is an externality only if its cost is not reflected in the price paid for whatever consumption activity caused the damage. In complex modern legal systems there are many ways in which the costs of environmental damage may be reflected, fully or partially, in prices. There may be a law requiring compensation of society or a private owner for the environmental damage. There may be a tradeable emissions permit required, which pays for equivalent pollution reductions elsewhere. There may be fees for permits that reflect environmental costs. There may be taxes designed to reflect environmental costs. There may be clean-up liabilities and required insurances. Or there may be nothing of the sort.

The externality cost is the dollar value of environmental damages that is not reflected in price. The third step in externality assessment - externality determination - is to determine the degree to which damage costs are not reflected in prices. This step too can be tricky and controversial. Yet there are often reasonable ways of answering this question.

B. Externality Consideration

Suppose we have reasonable externality assessments, including dollar valuations, for energy resources. (This would be the work of economists and other scientists.) How might we consider externalities in making decisions about energy planning and policy? (This would be the work of policy analysts and policy decision makers.)

This section will review some techniques for externality consideration that have been developed for planning in the electric utility industry (the industry for which this endeavor has been most intensively carried out). It will also review a variety of policy tools that are available for addressing externality problems.

1. Techniques of Externality Consideration

Planning in the electric utility industry is generally highly quantitative and rigorous. Planning software has been developed that makes it possible to develop meaningful resource comparisons on a ¢/kwh basis. These calculations can take into account many factors that distinguish resources and have a bearing on their value and cost. The least cost resource meeting current system needs would normally be selected.

lowest bid would normally be selected. The costs considered normally do not include external environmental damage costs.

A variety of techniques have been developed for incorporating externality costs into utility resource planning. The simplest is to list and perhaps categorize externalities for resources being compared and to give some sort of qualitative consideration to the externalities. Externality differences that appear significant on a commonsense basis can be given some weight, even if measurement and valuation are fairly incomplete. This could change the choice among resources from that which would have been made if externality differences between competing resources were ignored.

A second simple technique is to give percentage credits to environmentally favored resources and/or percentage penalties to disfavored resources. This might mean, for example, reducing a bid from a renewable resource provider by 15% for the purposes of selecting the winning bid.

A third technique would be to use weighting and ranking schemes. For example, a list of environmental concerns could be provided and each resource given a score for each concern. The total environmental

determined rule.

All of these techniques are easy to apply, and don't entail substantial data requirements. They also involve an unavoidable element of subjectivity and arbitrariness.

If full externality assessment is available a tool known as adders can be employed. Here the emissions associated with producing a kwh of electricity are known for each resource and are given a ¢/kwh external cost value. This value is then used to adjust costs or bids upwards, to arrive at a full social cost that includes both internal and external costs for each resource. The least full social cost resource is then selected. The same adders can also be used in system operation, to dispatch units on a least full social cost basis, instead of on a least internal cost basis, as is normally done.

The adders method has a strong rationale in economic theory, assuming that reliable externality assessments are available. This assumption, however, places tremendous scientific burdens on those who would develop the adder values, which in general are quite controversial (which is not to say that none of them are reasonable). As an alternative to damage cost adders, some have suggested that control cost

emissions associated with a generation resource to some standard or level that regulators or society has decided is acceptable. They are then used in decision making just as damage cost adders are used. The advantage of control cost adders is that they can be established accurately without the need for the extensive scientific work done in externality assessment. Some argue that they can be considered a reasonable proxy for damage cost adders. The rationale is that in requiring emissions to be controlled at acceptable levels society has revealed how much it is willing to pay to avoid environmental damages. There is some analogy here with how the market behavior of individuals reveals willingness to pay damage valuations, but the differences between political processes and efficient markets are also very great. Many practitioners feel that control cost adders are theoretically flawed, even if easier to implement than damage cost adders.

Another technique for externality consideration is multi-attribute tradeoff analysis. Here software is used to identify and graph the combination of cost and emissions characteristics of a large number of possible utility system resource portfolios. An efficiency frontier of possible systems (or resource portfolios) is identified by eliminating all points that are worse than some other point in both cost and emissions. (The resource portfolio efficiency frontier is similar to the pro-

introductory economics.) A selection of a preferred resource portfolio along the frontier can be made without assigning externality values to emissions. The shape of the frontier makes explicit the tradeoffs between cost and environmental quality that decision makers are considering. In practice, examination of the frontier will tend to reveal a range within which environmental improvements are fairly inexpensive, and a range within which they become increasingly unattractive. Multi-attribute tradeoff analysis is an extremely powerful and sophisticated tool. Yet if emission externalities are not assigned dollar values the choice of a preferred point on the resource frontier will contain an irreducible subjective element.

The techniques just described have been developed for planning decisions in electric utility regulation. However, they can readily be adapted to decision making in any policy area where some form of cost analysis is used.

2. Other Policy Tools for Addressing Externality Problems

A common approach to externality reduction is command and control regulation. An emitter is required by law to install such and such con-

of total reduction at minimum cost.

Another approach is emission standards or targets. Emitters are required by law to limit emissions to certain levels. They have some flexibility in how they achieve this, and therefore some ability to minimize costs. Effectiveness may depend on monitoring and enforcement.

Another approach is the use of emission fees and fuel taxes. Such charges can be designed to control emissions and use at desired levels, assuming that the demand curves for rights to emit and for fuels are known. This approach provides an incentive to the user to reduce emissions and/or fuel consumption to the greatest extent that he can do so cost-effectively. Fees and taxes of this sort can be designed to increase economic efficiency, and in theory could be used to replace the revenues from other kinds of taxes that interfere with economic efficiency (thus increasing the economic benefit).

Tradeable emission allowances are another tool that can be used to reduce externalities in an efficient manner. A cap on total emissions of P is defined, based on some standard of health or economic efficiency, and a number of allowances to emit so much P are issued, with total

to emitters on some rationale. Those whose expected emissions exceed their allowances must either install control technology or buy additional allowances. It is expected that they will choose the less expensive alternative. Those for whom control is relatively expensive will try to buy allowances. Those for whom control is relatively cheap will do so and thereby become able to sell their excess allowances. In theory, this approach will achieve the required reductions at the lowest possible cost, by providing a mechanism through which those who can reduce least expensively will profit from doing so.

Other tools include subsidies for environmentally favored activities, such as recycling, and liability for environmental damages caused.

ATTACHMENT A

APPROVED
APR 01 '94
BY GOVERNOR

CHAPTER
80
P & S LAW

STATE OF MAINE

IN THE YEAR OF OUR LORD
NINETEEN HUNDRED AND NINETY-FOUR

H.P. 278 - L.D. 356

An Act to Establish a Study Group on Energy and the Environment

Be it enacted by the People of the State of Maine as follows:

Sec. 1. Externalities study; study group. The Chair of the Public Utilities Commission, the Director of the State Planning Office and the Commissioner of Environmental Protection constitute a study group for the purposes of conducting a study of externalities in accordance with the provisions of this Act.

1. Duties. To the extent possible, within available resources, the study group shall:

A. Create a comprehensive library within the Public Utilities Commission of literature on environmental externalities. In creating the library, the study group shall create a separate file containing available summaries of the literature. The study group shall also identify specifically those portions of the literature that provide methods of evaluating the relative magnitude of different externalities;

B. Summarize state and federal environmental policies and regulations that presently impact the pricing of regulated and unregulated energy resources in Maine. The study group shall attempt, as far as possible, to quantify these impacts;

C. For the various energy resources, identify the most significant categories of environmental impacts that are not currently reflected in current pricing; and

D. Develop recommendations for preferred methods of accounting for the costs to society and the environment of environmental externalities.

For purposes of this section, the term "externalities" means those short-term and long-term impacts, with primary emphasis on environmental impacts, resulting from the extraction, production, transmission, consumption or utilization of energy or energy resources that are not accounted for or quantified in the context of state energy-regulatory decision making. For purposes of this section, "energy resources" includes energy derived from natural gas, coal, nuclear fuel, water, wind, demand-side management, biomass and refuse-derived fuel and petroleum products.

Sec. 2. Consultation. The study group may consult with any state agency, group or person, including, but not limited to, the Department of Transportation, the Maine Waste Management Agency, the Public Advocate and the Department of Human Services, Bureau of Health.

Sec. 3. Reports. On or before January 1, 1995, the study group shall provide an interim report to the joint standing committee of the Legislature having jurisdiction over utility matters outlining its progress in completing its study pursuant to section 1. On or before January 1, 1996, the study group shall provide its final report, with any accompanying recommendations for legislation, to the joint standing committee of the Legislature having jurisdiction over utility matters detailing the results of its study pursuant to section 1.

Sec. 4. Utilities committee authorized to report out a bill. The joint standing committee of the Legislature having jurisdiction over utility matters may report out a bill dealing with externalities to the First Regular Session or Second Regular Session of the 117th Legislature in response to the reports issued by the study group under section 3.