The Clean Air Act and Electric Generation Competition: A Win-Win Situation

Senate No. 1716

A Report of the
Senate Committee on Post Audit and Oversight
June 1994

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June 1, 1994

Edward B. O’Neill
Clerk of the Senate
State House, Room 208
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Dear Mr. O’Neill:

Pursuant to M.G.L. Chapter 3, Section 63 as most recently amended by Chapter 557 of the Acts of 1986, the Senate Committee on Post Audit and Oversight respectfully submits to the full Senate the following report: The Clean Air Act and Electric Generation Competition: A Win-Win Situation.

This report is based on research by the Senate Post Audit and Oversight Bureau. It examines the impacts of the Clean Air Act Amendments of 1990 and competition in the electric generation industry.

Respectfully filed by the Senate Committee on Post Audit and Oversight:

[Signatures of Committee Members]
EXECUTIVE SUMMARY

The Senate Committee on Post Audit and Oversight conducted a study of the federal and state air pollution policies governing the generation of electricity in Massachusetts. These policies, some of the most stringent in the nation, affect the ability of electric generators to produce low cost electricity. Thus, the ability of these generators to compete in a free market is adversely affected. The Committee therefore, also researched and explored ways to encourage the development of a framework which would allow the electricity generators to compete more effectively in an unregulated atmosphere. The Committee explored:

- the Clean Air Act Amendments of 1990
- Massachusetts Department of Environmental Protection air pollution policies
- Department of Public Utilities air pollution and competition policies
- Division of Energy Resources' State Energy Plan
- methods to increase wholesale generation competition

The Committee concluded and proposed:

- The Committee applauds the Department of Environmental Protection and its staff for the rapid and innovative path taken to comply with the regulations of the CAAA. The Committee finds that the use of market forces to determine the cost of compliance is consistent with the goal of promoting efficiency and thus least-cost compliance.

- The Committee believes Department of Public Utilities should, once again, review the use of environmental externalities to determine the usefulness of such externalities and the methodologies by which they are determined.

- The Committee finds that the Department of Public Utilities's action in order 93-112 is consistent with previous orders relating to cost which are below the $250 per kilowatt threshold established in the IRM framework. The Committee also urges the Department to issue order in 94-23 forthwith so that SO2 compliance costs may be treated appropriately and in a timely manner.
• The Committee agrees with the Massachusetts Energy Plan's hypothesis that increased efficiency and diversity will add stability to Massachusetts' energy base, reduce the state's exposure to price fluctuations and provide state support for competition in the energy market place.

• The Committee suggests, rather than focus on streamlining the integrated resource management (IRM) process, the Division of Energy Resources should concentrate its efforts on methodologies that would allow for a transition from a regulated market to a freely competitive market.

• The Committee finds that, as other states move toward a more competitive electricity market to solve the burden of high cost electricity, Massachusetts must make at least equivalent strides forward to make a smooth transition into the competitive realm.

The Committee presents several policy positions that it believes are worthy of exploration.

These positions are:

• disaggregate utility owned generation from utility transmission and distribution activities

• allow utility companies to maintain a regulated monopoly on transmission and distribution services

• deregulate utility owned generation so that there is a freely competitive generation market

• permit utility companies flexibility in the generation contracting process
FOREWORD

According to the Massachusetts Taxpayer's Foundation, electricity is one of the cornerstones of economic development in the Commonwealth. Unfortunately, Massachusetts has some of the highest electric rates in the nation. This has been the wellspring of economic revolt of some magnitude. Local business and community groups, as well as state legislators have voiced concern over the ever increasing cost of electric power in Massachusetts.

Thomas Edison once said, "(w)e will make electric light so cheap that only the rich will be able to burn candles." Keeping with this spirit, Massachusetts has traditionally been on the cusp of regulatory innovation regarding electricity.

Today, the electric generation industry stands on the edge of a new frontier. A frontier that marks the beginning of the age of competition in electric generation, it is an age that will see many vibrant companies fold under the pressures of a competitive market, while others rise up and meet the challenges that lie ahead. In the end, it will be the most efficient companies that are able to propel themselves past the others. In the end, market forces will determine the winners and the losers.
There is an obvious question that must be answered before we enter this new age. Do the regulations imposed on Massachusetts generators allow them to compete effectively?

The Massachusetts public has consistently supported a heightened standard of environmental protection. Hence, electric generators are subject to some of the strictest air pollution regulations in nation. Massachusetts has already imposed air emissions regulations that are, in fact, five years ahead of the newly enacted Federal Clean Air Act of 1990. The costs of complying with these regulations is just another part of the high cost of electricity in Massachusetts. Meanwhile, generators in neighboring states are forced only to comply with the minimum federal standard. This is one reason non-Massachusetts generators are able to produce less expensive electricity. Many argue that Massachusetts generators cannot effectively compete under current regulations.

Noting this injustice, in the Fall of 1993, I directed the staff of the Senate Committee on Post Audit and Oversight to investigate and evaluate some of the environmental regulations imposed on Massachusetts generators. The Committee subsequently produced a "white paper" outlining the air emission policies of the Massachusetts Department of Environmental Protection, the Department of Public Utilities, and the Division of Energy Resources. In the course of this research, it became apparent that a shift away from regulation in the electric generation industry could prove beneficial in this state.

Our research revealed that a transition toward a fully competitive electric generation industry was already developing in other key competitor states. If Massachusetts is to attain lower cost electricity in the future, we must adapt to this evolving competitive atmosphere. To propel forward and encourage initiative into this region, the Committee has developed a framework by which more competition can be gradually introduced into the local electric generation
Unlike the proposals put forth in other states, the Committee's proposal stops short of allowing free market competition immediately. The framework allows for the smooth transition from the highly regulated electric generation market of today, to the fully competitive market of tomorrow. In this transition time, all market participant will be able to relieve themselves of any regulatory burdens they may bear.

Electric power is crucial to the well being of the Massachusetts economy. The Committee's report, *The Clean Air Act and Electric Generation Competition: A Win-Win Situation*, presents some of the necessary regulatory oversight environmental factors place on electric generation. It also presents a logical framework by which the virtues of the competitive market can help to reduce electric rates.

I would like to thank the members of the Committee, the staff of the Bureau, the many members of the electric generation industry, and all others who have contributed to the preparation and completion of this report.

Thomas C. Norton, Chairman
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INTRODUCTION

In this age of social consciousness, all aspects of cost must be included in the pricing of electric power. Electric generation produces pollution, one cannot dispute that fact. Pollution, however, can be mitigated and controlled in a cost effective manner through the use of market mechanisms.

It is the duty of the regulators to assure that, given the strict environmental regulations, the least-cost power, from a societal perspective, is obtained. The actions taken thus far by the regulatory bodies in Massachusetts have gone a long way to achieving pollution control and least-cost electricity. Much progress has been made yet, there is much left to do. Policies of the past must be continuously re-evaluated and new policies must be established to further ensure that the utility companies and generators can effectively compete in the emerging competitive market place.

In recent years, the demand for electricity has decreased to a point where a capacity surplus may be experienced for the remainder of the decade. At the same time, concern for the natural environment has risen to an all time high. In a correct response to these two situations, Massachusetts regulators have relied more heavily on an integrated approach to planning for future energy needs. All supply and demand management options are considered in order to procure the least-cost energy resources in an environmentally sensitive manner. As a result of this integrated approach an increased dependence on market forces has come to the forefront in energy planning.

Recent actions by the Energy Facilities Siting Board have set the precedent for market forces
to play a major part in the future procurement of energy resources.\textsuperscript{1} It is now clear that accounting for and passing on the external costs associated with the generation of electricity can only be prudently accomplished by a new market driven atmosphere. Electric utility companies and non-utility generators alike, must consider all aspects of the economy and the environment. The Massachusetts Energy Plan takes steps to encourage market participants to rely on competitive forces when taking environmental aspects into account.

Increasing environmental deterioration coupled with concern for the quality of our natural environment has sparked widespread support for stricter environmental regulation. In the last few years one major focus of the regulatory bodies has been the emission of air pollutants from stationary sources, particularly electric generating facilities. Regulators have and continue to increase regulatory requirement pertaining to air emission in an attempt to control, reduce, and monitor these emissions. The use of competitive market has played a role in recent policies.

The Massachusetts Department of Environmental Protection (DEP) has developed an sulfur dioxide (SO\textsubscript{2}) emissions trading programs and strict nitrogen oxide (NO\textsubscript{x}) regulations under the Massachusetts Acid Rain Law (310 CMR 6.00-8.00). Also, the Division of Energy Resources is developing incentive policies to bring utility generating stations into CAAA compliance in a least-cost manner through the use of the competitive market. Not all policies rely on market forces, however.

Recent Department of Public Utilities (DPU) orders pertaining to the inclusion of environmental externalities rely on pre-determined values for pollutants instead of market forces. Also, DPU decisions regarding the treatment of CAAA compliance costs shun the use

\textsuperscript{1}The recent decision on the proposed Eastern Energy coal plant in New Bedford relies on market forces to determine the need for this project.
of market forces in favor of the existing Integrated Resource Management (IRM) framework.

This report by the Senate Post Audit and Oversight Committee looks at how state policies use competitive market forces to deal with pollution emissions from electric generating stations. The report focuses on how a developing competitive market is being relied upon to determine the true costs of environmental damage caused by electric generation. In this context, the use of the competitive market is explored and analyzed.

Competitive market forces have proven beneficial in least-cost pollution control. Competitive forces instill efficiency and innovation into the market. But, if Massachusetts is going to keep up with the market evolution brought about by competition, the fundamental structure of the electric generation industry must be changed.

One fact is clear: the regulations that currently govern the production, procurement, and sale of electricity make it unlikely that an effective competitive market can be achieved. The Committee believes that increasing the use of competitive forces can raise the efficiency and innovation of the market participants. Consequently it, therefore, presents the proposed methodologies and processes by which to increase the level of market competition. The first three sections of the report address where competition has been introduced into the market and how a restructuring of the generation industry could increase the use of competitive forces to assure least-cost generation.

Section one of the report addresses the various regulatory agencies involved in the implementation of CAAA. Implementation on the national level by the Environmental Protection Agency is discussed as is the state level implementation by the Department of Environmental Protection, the Department of Public Utilities, and the Division of Energy
Resources.

The second section of the report visits the Massachusetts Energy Plan as put forth by the Governor and DOER. Actions offered by the Plan pertaining to the use of market mechanism to assure least-cost compliance with CAAA are examined.

Section three focusses on how increased competition in the wholesale generation market could increase efficiency and pollution control. The section lays out a suggested framework which could create a level playing field for all participants in the wholesale generation industry, one which would use market forces to achieve efficiency.

The final section of the report presents the Committee's conclusions and recommendations.
SECTION ONE: REGULATORY AGENCIES

Several regulatory agencies have promulgated rules and regulations governing the treatment of pollutants and environmentally harmful emissions. These rules and regulations offer a wide variety of possible emission reduction options, ranging from providing emission reduction credits to the use of environmental externalities. Each of these programs is directed toward reducing pollution in the least-cost manner.

Both federal and state agencies have had a role in requiring the cleaner generation of electricity. Nationally, the Environmental Protection Agency (EPA) has enacted strict emissions regulations in the Clean Air Act Amendments of 1990. Closer to home, the Massachusetts Department of Environmental Protection (DEP) has lowered its tolerance for air pollution and introduced strict new emission regulations. At the same time, the state's Department of Public Utilities (DPU) and Division of Energy Resources (DOER) are working to develop policies which will ensure that Massachusetts citizens obtain low polluting electric generation at the least-cost possible to society.

Environmental Protection Agency

The Environmental Protection Agency (EPA), the federal agency mandated with protecting the environment, has been at the forefront of the national charge against pollution. The 1990 amendments to the Clean Air Act (CAA) is a sweeping reform to lower air emissions and vastly improve air quality. The 1990 amendments set new time frames and milestones for states, demanding that they meet and maintain national ambient air quality standards (NAAQS) for five priority air pollutants: sulfur dioxide, carbon monoxide, particulates, nitrogen dioxide, and ozone.²

²1990 Federal Clean Air Act Amendments: The State Implementation Plan (SIP) for Ozone, DEP Info at 1.
Under the Clean Air Act Amendments of 1990, all states which do not currently meet the health-based standard for ozone must develop and implement strategies for attaining it. They also must remain in attainment of the standards while allowing for future economic growth. Massachusetts is classified as being in "serious" non-attainment for ozone, and is required under CAAA to achieve the NAAQS for ozone by 1999.\(^3\)

Sulfur Dioxide (SO\(_2\)) and nitrogen oxides (NO\(_x\)) have been of considerable concern in New England. Both are by-products of fossil fuel combustion and both contribute significantly to acid deposition. By-products from current methods of electric generation are a major contributor to SO\(_2\) and NO\(_x\) levels. As Massachusetts tightens its emissions belt, other states have fallen far behind in the regulation and reduction of all pollutant emissions. Massachusetts has imposed restriction on NO\(_x\) emissions and established a SO\(_x\) emissions reduction credit trading program. However, nationwide, fifty power plants, primarily older facilities not subject to the regulations are responsible for one-half of all SO\(_x\) emissions.\(^4\) Appendix One lists these fifty emission giants.

The location of these generating stations is like a wall surrounding the Northeast. As the pollution belched from these fifty plants travels across our boarder, the benefits sought by the restrictions Massachusetts has imposed on its own generating facilities are undetermined. The relief sought from the Massachusetts Acid Rain Law will be inconsequential. SO\(_2\) is a main cause of acid rain and as long as it is belched from these plants at the current rate, Massachusetts will continue to be adversely affected by acid deposition. Acid rain and its other related environmental consequences will continue to be a problem for the Commonwealth.

Figure One illustrates the location of these fifty plants relative to Massachusetts.

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\(^3\)1990 Federal Clean Air Act Amendments: The State Implementation Plan (SIP) for Ozone, DEP Info, at 1

\(^4\)Blue Skies, Green Politics: The Clean Air Act of 1990, Gary C. Bryner, at 68
"X" denotes location of generating station.

Figure 1

The EPA has built some flexibility into the CAAA for these fifty plants. Plants in Ohio, Illinois, and Indiana that must achieve SO2 reductions will receive an additional 200,000 tons of allowances annually in order to decrease the reductions these plants will have to make and thus ease the compliance burden.5 Basically, the EPA is offering rate relief to the customers of these utilities by allowing a slower compliance time. Unfortunately, by allowing more pollution to be discharged from these plants, the EPA may be increasing the burden on New England as it seeks to comply with the requirements of CAAA and state mandates. This is neither fair nor equitable to this region and should be strongly protested by the elected federal representative of Massachusetts.

Nonetheless, the CAAA has renewed the spotlight on utility generation's contribution to the
levels of these pollutants. Three provisions of the CAAA, Title I, Title IV and Title V, directly address electric utility generating stations. While it is tedious to present a summary exposition of these provisions, they are key to understanding the actions of both regulatory oversight and the need to achieve a restructuring of the generation market.

Title I

Title I contains the requirements which must be met by all states not attaining the National Ambient Air Quality Standards (NAAQS). The NAAQS for ozone is not being achieved in Massachusetts because, in part, of high levels of NOx emissions.

Currently, Massachusetts is working with states from Virginia to Maine, on an ozone compliance strategy. This strategy, according to Air Quality Control officials, will contain strict NOx emission standards for utility sources. Any source emitting more than fifty tons of NOx per year must implement an emissions control plan using reasonably available control technology (RACT). Air Quality Control officials indicated that most of the electric generating units in Massachusetts have already or could inexpensively accomplish NOx emission reductions through the use of RACT. These standards must, under Title I, be in place by May, 1995.

Compliance with Title I standards should be adequate for compliance with the NOx standards set in Title IV.

Title IV

EPA has established a goal to reduce sulfur dioxide emissions in the continental United States. Under Title IV of CAAA, utilities must reduce SO2 emissions to a level 10 million tons below 1980 emission levels by the year 2000. Moreover, by 1995, the 110 most polluting power plants
in the nation will have to meet more stringent emission standards.\(^6\)

The emissions of nitrogen oxides (NOx) must also be reduced. Beginning in 1995, the emissions of nitrogen oxides must be reduced by two million tons per year from 1980 levels.\(^7\) The first NOx reductions began eighteen months after enactment of CAAA and must be completed by 1995. Depending upon the state of NOx control technology, the CAAA could require additional restrictions on NOx emissions by 1997.

To help achieve its goal of sulfur dioxide reductions, EPA has set up a marketable allowance system. This system uses marketplace mechanisms to encourage reductions in emissions. The marketable allowance system is also combined with the requirement that generation facilities install continuous emission monitoring (CEM) systems. The CEM measures the amount of pollutant emitted at a facility on a continuous basis. At full implementation, the number of allowances will be limited to only 8.9 million with each allowance being for one ton of pollution.

The sulfur dioxide emissions reduction program is broken down into two phases. Phase I mandates that the power plants listed in the CAAA (over 110 of them), reduce emissions of sulfur dioxide to 2.5 pounds per million Btu by 1995. Utilities with plants that have emissions below the permitted levels earn allowances which are able to tradable or salable to those utilities that have plants with emissions that are not in compliance. Plants that do not have sufficient allowances to cover their current emissions must either purchase additional allowances, or make plant modifications to reduce their emissions. There are no generating

\(^6\)Blue Skies, Green Politics: The Clean Air Act of 1990, Gary C. Bryner 1993 Congressional Quarterly, Inc. at 126

\(^7\)Summary of the Clean Air Act Amendments of 1990, State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials, November 21, 1990, at 22.
facilities operating in Massachusetts designated as Phase I participants.

Phase II mandates that by the year 2000, all power plants emitting sulfur dioxide reduce emissions to a rate of 1.2 pounds per million Btu. Phase II sets a national cap of 8.9 million tons of SO₂ emissions per year.¹⁸ No allowances are allotted for any new plant that begins operations after 2000. Plants beginning operation in the post-2000 period must obtain emission allowances from existing plants.

Title V

Title V of CAAA is an administrative requirement that all major emission sources be issued an operating permit. The operating permit indexes all existing state and federal requirements for a particular source into one document.

A generation facility may not emit any SO₂ for which it does not hold a permit. If a facility emits less pollution than it has permits for, the excess allowances may be sold, banked, or traded either intrastate or interstate. The transaction is at the discretion of the holder as long as the transaction does not increase the total amount of pollution being emitted. A facility that emits more SO₂ than for which it has permits would face severe penalties. Emissions would be continuously monitored for compliance with the reduction goals of CAAA, and if necessary, EPA would reduce the number of emissions allowances to comply with the national emissions cap.⁹

While the Clean Air Act Amendments of 1990 are a major step towards a cleaner, healthier air quality, and highly desirable, Massachusetts utilities must now assess the impacts and costs of

¹⁸Ibid., at 22
⁹Ibid., at 22
compliance and, in a least cost manner, meet the requirements of the CAAA.

State and Federal regulators are working to finish the stage on which compliance activities will be played out. The regulatory framework by which utilities will be required to comply with the CAAA will determine the cost of this national policy. Massachusetts regulators have already begun to change the framework.
Massachusetts Department of Environmental Protection

The Massachusetts Department of Environmental Protection is charged with protecting the environment on a state-wide level. Chapter 590 of the Acts of 1985, An Act Limiting Acid Rain and Acid Deposition, endorsed the Department of Environmental Protection's efforts to establish limits on the amount of acid rain causing pollution emitted in the Commonwealth. Chapter 590 allows DEP to promulgate rules and regulations governing the emissions of sulfur dioxides on a statewide level.

In September of 1993, the DEP filed regulations with the Secretary of State relating to the guidelines established under Chapter 590. The regulations, 310 CMR 6.00 - 8.00 establish standards for ambient air quality, air pollution control, and abatement of air pollution emergencies. These regulations are comprehensive and set strict standards for the regulations of pollution emissions throughout the Commonwealth.

The emissions limits set under Chapter 590 and put forth in the regulations must be met by all electric generating facilities operating in the Commonwealth by 1995. The limit set on sulfur emissions rates is 1.2 pounds per million Btu; approximately 417,000 tons per year. This rate is equivalent to the emissions rate imposed for the year 2000 under Phase II, Title IV of the CAAA. Because of the regulations being imposed on Massachusetts utilities by the state Department of Environmental Protection, Massachusetts electric generating facilities will be in compliance with CAAA well in advance of the federal deadlines.

According to officials from the Division of Air Quality Control of the Massachusetts Department of Environmental Protection, the operating permit program is designed to improve air quality management in several ways. First, all applicable air program requirements for a source are consolidated into one publicly available permit. Second, the program provides
industry with a clear indication of the emission limits they must meet, while affording operational flexibility to make certain changes. Third, state implementation of the criteria pollutant control programs are better facilitated.

The operating permit program is intended to clarify the applicable requirements of CAAA for subject sources, consolidate those requirements into a single federally-enforceable document, and enhance compliance and enforcement activities by Federal, State, and local levels of government. DEP indicates that the operating permit program will be used to implement Phase II of the acid rain program set forth in Title IV of CAAA. In Phase II, the State is required to administer a federally approved permit program. The allowance trading provisions of Title IV, will theoretically lower the cost of the acid rain compliance by allowing sources to find the least cost method by which to adhere to set emission limits.

One of the most innovative programs to help reduce the level of air pollutants is DEP’s Innovative Market Program for Air Credit Trading (IMPACT). Any facility that is able to meet or exceed the emission control limits set forth in the regulations, earns emission reduction credits under the DEP’s IMPACT program. DEP developed IMPACT in order to streamline the regulatory process for intrastate emissions trading. Before the development of IMPACT, both state and federal trading permits were required for trades made intrastate. IMPACT, if approved by the EPA, would require only a single permit for all intrastate emission trading.

A DEP initiative to assist facilities subject to the provisions of Title I of CAAA, under IMPACT, companies earn emission reduction credits through achieving reduction in volatile organic compounds (VOCs), NOx and CO. The earned credits can then be banked, traded, or sold to companies needing credits to offset their emissions from their electric generating operations within Massachusetts. IMPACT allows the invisible hands of the competitive market
to establish the price of emission reduction credits, thereby effectively controlling the costs of compliance.

As the first state to undertake a comprehensive emissions reduction credit program, Massachusetts should serve as the model for the region and possibly the nation.\textsuperscript{10} \textit{The Committee applauds the Department of Environmental Protection and its staff for the rapid and innovative path taken to comply with the regulations of the CAAA. The Committee also finds that the Department's use of market forces to determine the cost of compliance is consistent with the goal of promoting efficiency and thus least-cost compliance.}

\textit{Massachusetts Department of Public Utilities}

More so than any other state agency, the Department of Public Utilities (DPU) has the ability to shape the implementation of policies governing the electric generation industry. DPU is responsible for the direct regulation and oversight of the electric generation industry in Massachusetts. It is the duty of DPU to regulate electric generators within the framework established for environmental standards. DPU, in its rulings, has to take into account environmental consequences as well as traditional rate related matters.

The Department has taken bold steps to see that electric utility companies comply with the regulations of the CAAA and the Massachusetts Acid Rain Law. Several rulings pertaining to environmental regulation compliance have been issued by DPU. One such set of rulings requires that the evaluation of all new resource acquisition by electric utility companies include the cost of certain environmental externalities that take into account the environmental damage caused by electric generation.

\footnote{Bay State Develops Emissions Trading Program, \textit{Fortnightly}, Vol. 131, No. 21, November 15, 1993 at 10}
Environmental externalities were brought to the forefront in order DPU 89-239: *Investigation by the Department of Public Utilities on its own motion into proposed rules to implement integrated resource management practices for electric companies in the Commonwealth*. Under this order, environmental externalities for air emissions: nitrogen oxides, sulphur oxides, volatile organic compounds, total suspended particulates, carbon monoxide, carbon dioxide, methane, and nitrous oxide are to be used in evaluating the emissions of energy resource options during the integrated resource management (IRM) resource selection process.

Accounting for externalities in this instance, incorporates the cost of environmental damages caused by the generation of electricity. DPU Order 89-239, defines environmental externalities as:

> the cost of environmental damages caused by a project or activity for which compensation to affected parties does not occur, regardless of whether the costs are imposed within Massachusetts borders or elsewhere.

The Department assumes that the cost of externalities will represent any damage done subsequent to the utility complying with all regulations imposed by federal, state, and local authorities. Environmental externalities cover all aspects of environmental degradation, from air pollution to ground water contamination, however, at this point in time, externality values have only been established for air borne pollutants. In essence, DPU is stating that the protection afforded the environment by the current regulations is insufficient. To adequately protect the environment, externality cost, above and beyond regulatory mandates, are needed to ensure the environment is free from unnecessary pollution.

The DPU has decided to monetize environmental externalities. According to Order 89-239, monetizing environmental externalities should approximate the expected level of environmental impact associated with a particular project. The costs of the externalities are
added directly to the bid prices of both proposed and existing resources under IRM. Monetizing externalities, while highly subjective, should make the economic selection of resources clearer because all costs are internalized into the selection process.

Because of the subjective nature of monetizing externalities, the DPU sought a consistent monetized value. The Department found that using the marginal cost of pollution control would establish monetized externality values that best estimate the damage costs of pollution.\textsuperscript{11}

The subjective nature of externalities and the subsequent reliance on marginal control costs has been a focal point of controversy within the different segments of the electric generation industry. This controversy was aired in a subsequent docket; DPU 91-131, \textit{Investigation by the Department of Public Utilities on its own motion as to the environmental externality values to be used in resource cost-effectiveness tests by electric companies subject to the Department's jurisdiction.} DPU opened this docket on June 14, 1991 to re-evaluate the use of and values established for externalities as established in DPU 89-239. In opening 93-131, DPU indicated its intent to periodically review new information that becomes available regarding the use and value of externalities.\textsuperscript{12}

In 91-131, the Department reiterated that resource decisions have major impacts on the environment, and environmental externalities must be considered in order to ensure least-cost resource selection. The Department also stated its commitment to be responsive to ever-changing environmental regulations. One change that had occurred since the initial order in 89-239 was in the method of the valuation of externalities. Several parties to the docket

\textsuperscript{11}DPU 89-239 at 70

\textsuperscript{12}DPU 91-131 at 1
recommended the use of damage costs or "damage valuation" (DV) rather that the use of "implied valuation" (IV) as had been put forth in DPU 89-239.

In order to be able to evaluate the estimates made under the "DV" and "IV" methods, DPU established criteria for the comprehensiveness and reliability of the estimates. If a company could come up with an estimate that, using either method, met these comprehensiveness and reliability criteria, the estimate could be used to value externalities.

The Department determined that the DV method failed to satisfy the comprehensiveness and reliability criteria. The Department also found that:

\[\text{(s)ince environmental regulations are established through a political decision-making process involving input from the scientific community, members of the public, environmental organizations, and competing economic interests, the IV method represents a reasonable proxy for what society is willing to pay to avoid damages from pollutant emissions.}^{15}\]

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**Table One**

The Department further found that if satisfactory DV estimates were not available, the Department would rely on the IV method as the basis for the valuation of environmental

\[^{15}\text{DPU 91-131 at 44}\]
externalities for use in the solicitation of new resources under the Department's integrated resource management (IRM) policies. This finding reaffirmed the findings of DPU 89-239.

Representatives of the utility industry have argued that the Department's comprehensiveness and reliability criteria may result in valid DV estimates being eliminated from consideration in favor of higher-priced IV proxies. The Externality values established in DPU 91-131 can be found in Table One.

Utility companies argue that the elimination of realistic DV estimates in exchange for higher-priced IV estimated may impose undue costs on the Massachusetts ratepayer. Unrealistic estimates of pollution costs may also be a barrier to fostering increased generation competition. If the current values posed by the IV method are artificially high, the outcome of the competitive market during the resource selection process could be distorted.

_The Committee believes DPU should, once again, review the use of environmental externalities to determine the usefulness of such externalities and the methodologies by which they are determined._

On January 25, 1994, the DPU issued order DPU 93-112, _Investigations by the Department of Public Utilities on its own motion into the effects of implementation of the Clean Air Act Amendments of 1990 on the resource planning and procurement of electric companies subject to Department's jurisdiction_. This order determines how utility companies should treat the costs of complying with the regulations of the CAAA, particularly the "appropriate mechanisms for allowing timely Department review of utility plans for compliance with CAAA consistent with protecting the public interest."15

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14 Conversations with various electric utility companies.

15 DPU 93-112; Notice of Inquiry and Notice of Public Hearing and Order Seeking Preliminary Comments, at 5
According to the order, the existing Integrated Resource Management (IRM) framework is adequate for treating the costs of compliance with the CAAA. The current framework states that:

Investments by an electric company that are not subject to the pre-approval or IRM regulations are reviewed in the context of rate case proceedings before the Department.

In the eyes of the IRM process, a major investment at an existing facility is one that would

(1) materially extend the useful life of the facility, (2) materially increase the capacity of the facility, or (3) are expected to exceed $250 per kilowatt of net maximum capacity.

The Department found that the existing IRM process

represents the best mechanism by which to ensure that electric companies will select least-cost CAAA compliance paths on a timely basis and... will provide sufficient protection for the ratepayers of the Commonwealth.

While the Department attempted to address compliance costs in this latest order, it delayed addressing the issues relating to the sulfur dioxide requirements of Title IV of the CAAA. The Department stated that a docket pertaining to the treatment of costs related to the SOx emission reduction trading program would be opened.

Subsequently, the Department, opened docket 94-23: *Investigation by the Department of Public Utilities on its own motion into the regulatory treatment of electric company costs incurred in order to comply with the sulfur dioxide provisions in Title IV of the Clean Air Act Amendments of 1990.*

The Department is currently reviewing testimony for that docket and is expected to issue a ruling shortly.

*The Committee finds that the Department's action in order 93-112 is consistent with previous orders relating to cost which are below the $250 per kilowatt threshold established in the IRM framework. The Committee also urges the Department to issue order in 94-23 forthwith so that SOx compliance costs may be treated appropriately and in a timely manner.*
According to the testimony received by DPU in docket 93-112, the majority of facilities located within the Commonwealth will be able to come into compliance with the requirements of CAAA and the Massachusetts Acid Rain Law with relatively minor emission control modifications. However, further restrictions on emissions may hinder the ability of some older generating facilities to compete with low-cost, low-emitting, gas-fired generation.

Increased restrictions may require greater modifications to existing plants, possibly to a point beyond the $250 per kilowatt threshold established by DPU. If plant modifications exceed the $250 per kilowatt threshold, DPU would be required to implement regulatory proceedings to ensure least-cost modification activities at each facility.

The Division of Energy Resources (DOER) has identified 1,725 megawatts of non-peak generation at plants that relative to other generating sources, may incur high costs to comply with air pollution regulations. A study conducted for the Massachusetts Division of Energy Resources and referenced in the Massachusetts Energy Plan calls for the competitive market to determine the fate of these older generating stations.
SECTION TWO: MASSACHUSETTS ENERGY PLAN

In the Spring of 1993, the Governor and the Division of Energy Resources (DOER) unveiled the Massachusetts Energy Plan. The plan places an emphasis on "stimulating business growth, reducing the cost of energy to business and consumers and creating jobs while maintaining high environmental standards."\(^{16}\)

One of the goals of the Massachusetts Energy Plan is to ensure that Massachusetts has an adequate, reliable, and least-cost supply of energy which results in a reduction of emissions from the generation process. This goal is aimed at meeting the standards of the Massachusetts Acid Rain Law and the CAAA through improved efficiency and resource diversity.

Efficiency is defined as the use of less energy to accomplish more tasks. According to the Plan, this is done by using new technologies and improving power plant operations. Newer electric generating facilities have demonstrated that increasing efficiency and using state-of-the-art pollution control technologies will reduce pollution levels below those of existing plants by a factor of six-to-one.\(^ {17}\)

Addressing energy matters in a timely manner is another way of providing savings in the electric power industry; this can be accomplished through the streamlining of the regulatory process. DOER has indicated to the Committee that a streamlined regulatory process is currently being explored by the Market Reform Task Force established under the Plan.

DOER has also promoted the development of energy efficiency programs. Several pieces of

\(^{16}\)Massachusetts Energy Plan, 1993, Division of Energy Resources at 1

\(^{17}\)Clean Energy Solutions: Independent Power and the Environment; National Independent Energy Producers; November 1993 at 5
legislation designed to increase the role of energy efficiency programs have been filed for the 1994 legislative session by DOER. By taking the initiative in energy efficiency and conservation, DOER is helping to advance this theme as forwarded in the energy plan.

Diversity is another of the Plan's themes. Diversity, according to the Plan, is achieved through the establishment of a portfolio approach to energy planning. That is, many sources of energy should be used to meet demand instead of relying on just one or two. Theoretically, a portfolio approach will reduce the risk of price and supply volatility by lessening the state's dependence on any one fuel, and promotes the use and development of clean energy sources.

The Plan calls for the reduction of dependence on any one source of fuel for the production of electricity. Currently, the Massachusetts utilities fuel portfolio consists of oil (38%), coal (28%), natural gas (15%), nuclear (13%), and hydro (6%). Nationally, the fuel portfolio consists of oil (4%), coal (55%), natural gas (10%), nuclear (21%), and hydro (10%). The plan calls for the reduction in the Commonwealth's reliance on imported oil, along with greater reliance on natural gas and renewable energy sources. Increasing reliance on natural gas will help spur the development of natural gas pipelines into Massachusetts. While there are several proposals to do so, pipeline expansion will not be fully exploited until there are incentives for fuel switching or expansion of gas-fired generation resources.

*The Committee agrees with the Plan's hypothesis that increased efficiency and diversity will add stability to Massachusetts' energy base, reduce the state's exposure to price fluctuations and provide state support for competition in the energy market place.*

The plan includes a series of recommendations and actions which DOER and the Governor

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encourage the legislature and regulatory agencies to enact. One such action is the development of incentives for the early retirement of power plants in order to come into compliance with the provisions of the Clean Air Act Amendments of 1990. DOER is to "recommend appropriate incentives and removal of disincentives for the early retirement of old and inefficient power plants." In comments to the Committee, DOER appears to be backing away from this commitment. When questioned about the early retirement policy, DOER stated that they "do not have a strategy to shut down older power plants," DOER also stated that it does not "suggest the 'premature retirement' of any particular plants; rather, DOER advocates delivering electric service to ratepayers on a least-cost basis." DOER delayed implementation of these incentive due to the order in DPU 93-112 regarding CAAA compliance costs. However, compliance costs are sure to be an issue in future IRM proceedings.

DOER, in the plan, has identified a total of 1,736 megawatts of fossil fuel-fired non-peak utility generating capacity located in Massachusetts that is older than twenty-five years. This fact makes the utility generating fleet in Massachusetts one of the oldest in the nation. An analysis performed for DOER suggests that, for some of these older generating units, the least-cost CAAA compliance strategy would require shutdown and replacement of the existing plants. A fleet wide-shift to this policy may be a fallacy of composition.

The assumption behind the drive toward the early retirement of these older plants is that the new plants which would replace them would be cleaner and more efficient. Indeed, in today's ever more competitive market, the reliance on emerging gas-fired non-utility generation evidences the fact that modern generating stations are, for the most part, more efficient and cleaner than the existing older fleet of generating facilities. New, state-of-the-art generation

19 Massachusetts Energy Plan at 29

20 DOER comments, 3/21/94 and 3/31/94
facilities help in reducing the levels of air emissions. The difference between most older generating plants and the newer ones is dramatic. The older generating plants are dirtier by a factor of six-to-one.\textsuperscript{21} Moreover, by replacing older facilities that have become no longer economically efficient, utility companies and other generators may be able to achieve a net improvement in air emissions and thus earn emission reduction credits.

An increased reliance on gas-fired generation will also help to increase development of new natural gas pipelines. The expansion of pipelines into Massachusetts will allow some existing facilities to switch from other fuels to cleaner burning gas. This will also reduce air emissions and possibly increase the efficiency of existing units. Those generating units that become relatively less economically desirable may then be unable to survive in the freely competitive markets of the near future.

\textbf{DOER ANALYSIS}

DOER commissioned the Boston based consultant La Capra Associates to conduct a study which "examines the relative costs and benefits of the accelerated retirement of certain older electric power plants in Massachusetts versus the continued operation of these plants (with required modifications to comply with the CAAA and Massachusetts Acid Rain Law.)"\textsuperscript{22} Table Two lists the plants considered in the report.

The analysis emphasizes two themes: 1) plant modification and retirement and, 2) accelerated plant retirement, and assumes that utilities would comply with the requirements of the CAAA through either plant operations modification and selected early retirement or through plant replacement.

\textsuperscript{21}Clean Energy Solutions at 5

\textsuperscript{22}DOER consultant's analysis at iii
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<tr>
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**Table Two**

The consultant's report examines three replacement capacity cases: 1) "coal oriented replacement case" where replacement is exclusively done with new coal-fired atmospheric fluidized bed (AFB) replacement; 2) "coal and gas replacement case" where new gas-fired combined-cycle and AFB units are utilized to replace capacity; and 3) "gas oriented replacement case" where replacement is done with gas-fired combined-cycle units exclusively. According to the report, the results of the analysis depend in part on the choice of replacement capacity for existing units once they are retired.

Whether it is more or less prudent to accelerate the retirement of existing facilities, the report suggests, depends on the choice of replacement capacity. Replacement with gas-fired units were, in general, less costly and less polluting than the "coal and gas oriented case" or the "coal oriented case." Given these factors, the report finds that:

at least for certain units, accelerated plant retirement may be a least-cost CAAA compliance strategy from a societal total cost of electric service perspective.

The analysis also suggests that in the short-run, because of the required expenditures for new
capacity, the accelerated retirement of units would increase rates. The Committee recognizes the fact that all prudent actions taken by individual utility companies in order to comply with CAAA may result in short-term cost increases of some magnitude to the consumer.

The report, *A Review and Analysis of the Massachusetts Energy Resource Planning and Procurement Regulatory System*, concludes by recommending that:

it would be appropriate to subject plant modification proposals to competition through the Integrated Resource Management ("IRM") process or some other appropriate regulatory forum.

DOER has suggested that a more appropriate framework than IRM is available for the evaluation of CAAA compliance costs. The framework DOER has described to the Committee, would be based on the competitive forces of the market. Under the DOER framework, those aspects of the current IRM process that encourage competition would be streamlined to allow competitive bidding processes to be completed in a manner more timely than the twenty-four months presently required for IRM.

*The Committee suggests, rather than focus on streamlining IRM, DOER should concentrate its efforts on methodologies that would allow for a transition from a regulated market to a freely competitive market. The Committee finds that, as other states move toward a more competitive electricity market to solve their woes of high cost electricity, Massachusetts must make at least equivalent strides forward to make a smooth transition into the competitive realm.*

The DPU has recognized that, the current trend toward increasingly stringent environmental regulation will most likely continue.\(^{25}\) With the likelihood of stricter environmental standards being imposed on the emissions of generating facilities in Massachusetts, station

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\(^{25}\)DPU 91-131 at 10
closure may become a more prevalent compliance option to utility companies. That reality, when combined with the workings of the competitive market, will assure that only the least-cost resource options are utilized to meet the requirements of environmental regulation.

Such a combination of factors prompted the Committee to expand its original review of the Clean Air Act and associated costs to seek information on the possible expansion of the forces of competition. Therefore, on April 1, 1994, the Committee sent letters seeking comment regarding methodologies and processes to increase competition in the wholesale electric generation industry to several interested parties. The following is a discussion of the process by which regulators can ensure that there is a smooth transition to the competitive electricity market of the future.
SECTION THREE: Structure for Transition into a Competitive Market

Competition transforms every aspect of an industry. The electric generation industry is no different. Competition in electric generation has initiated changes that have propelled the industry from an inefficient behemoth to an industry that is innovative, technologically advanced, and increasingly more efficient. Despite all the changes that have been brought about by competition, new, startling permutations continue to occur, especially at the retail level.

Recently, the California Public Utility Commission proposed to implement retail competition among electric generators.\textsuperscript{24} Retail competition allows utility customers to buy electricity from any generation source, while ensuring that the utility company will transmit the power. Thus, all generation sources are granted access to a utility company's transmission and distribution system, even though the sources are taking away existing customer base. Retail competition enables regulators and utility customers, lucky enough to be able to so buy, to realize the benefits available through a fully competitive market.

Retail competition would be a radical step from the current structure of the generation industry in Massachusetts. Today's electric generation industry does not operate in a fully competitive market. Rather, the market today is only semi-competitive with some regulated and some non-regulated participants.

Regulated and non-regulated generation entities cannot and do not compete with the same level of flexibility required of successful participants in a truly competitive market atmosphere. Because of past public policy decisions, the current state regulations do not allow utility owned generation units the flexibility to compete in a free market. Because of such regulatory

\textsuperscript{24}Regulators Propose Direct Competition For Providing Electricity in California; Wall Street Journal; April 21, 1994
restriction in this state, it appears that a more conservative transition toward retail competition would be appropriate given the present structure of our electric generation industry. In the Committee's view, such a measured transition would allow both regulated and non-regulated electric generators the time necessary to prepare for the rigors of an expanded free market.

In anticipation of the fact that the demand of an even more rigorous market will be on us sooner than later, the Committee has studied several processes which would enable Massachusetts to implement a smooth transition from today's electric generation industry to a fully competitive industry of tomorrow. The Committee cautions that a shift in state policy that does not allow for a gradual transition from today's market towards a more competitive market may result in disastrous consequences for large blocks of ratepayers in the Commonwealth.

The Committee sought and received comments from participants on both the regulated and non-regulated sides of the electric generation industry regarding processes to increase competition in the generation industry. Several common themes were present in the majority of the comments. The comments suggested that the process allow for flexibility, allow market participants to respond to customer demands in a timely manner, and be equitable for all market participants. Based on these fundamentals, the Committee began to develop a suggested process which it believes could help move the electric generation industry into a more competitive market.
INCREASING COMPETITION

Economists find competition desirable because a competitive market produces more output than a monopoly market and sells the output for less. Economic law dictates that as the level of competition increases, profitability decreases. Thus, in order to maintain a level of profitability, companies are forced to become more efficient. Those companies whose efficiency does not increase will eventually fail in the competitive atmosphere. If a policy of full-scale, free-market competition is applied to the wholesale electric generation market, the forces inherent in competitive markets should decrease prices and promote greater efficiency. However, for true competition to develop in the wholesale electric generation market, both the utility companies and the non-utility generators must be given the tools with which to build a market.

If the goal is to promote an ever more competitive electric generation market, the Committee believes that DPU must allow for a restructuring of the generation industry in such a manner that no participant is benefitted or hampered by regulation. Restructuring of the market may be considered radical by some, however, there is a strong belief in the industry that a restructuring is necessary in order to realize the benefits of true competition. A consensus seems to be forming that all generating units must be allowed to participate in a fair and market-driven atmosphere, and that no one generation entity should be adversely impacted by restrictive regulations.

Increasing competition in the generation market could bring about many changes. Environmental compliance would be met in a least-cost manner due to the inherent nature of competition; only the most efficient and thus least-cost resources will be utilized. Competition should also lead to innovation.

25 Reason for Pessimism: Robert J. Michaels; Public Utilities Fortnightly, Sept 15, 1993 at 18
Innovative technologies can help improve the quality of air emissions and reduce air pollution. We have already seen how newer technologies are less polluting than older generating facilities by a factor of six-to-one. Increased competition may also encourage the upgrading of existing facilities which are no longer able to meet pollution control requirements and/or cannot compete effectively in the emerging wholesale generation market.
A PRESCRIPTION FOR COMPETITION

Because the Committee wants to encourage moves to a more competitive market it is suggesting several changes that it believes are worthy of exploration:

- disaggregate utility owned generation from utility transmission and distribution activities
- allow utility companies to maintain a regulated monopoly on transmission and distribution services
- deregulate utility owned generation so that there is a freely competitive generation market
- permit utility companies flexibility in the generation contracting process

These changes, the Committee also believes, should be structured so as to allow all regulated and non-regulated market participants the time to adjust business practices in order to effectively operate in a competitive atmosphere.

UNBUNDLING GENERATION

The first change that must be made to the current industry structure is to unbundle the generation activities of electric utility companies from the utility’s transmission and distribution activities. This will mean that utility companies may, but no longer have the right to, generate electric power.

For almost a century, electric utility companies held a monopoly on the generations of electric power. This monopoly was granted because of the economies of scale that were available from the construction of large generating facilities. But world events and the pace of new technology began to force a reexamination of these accepted monopolies in the mid-1970’s.

By 1978, this reexamination had enough cogency to prompt Congress to enact into law the Public Utilities Regulatory Policies Act (PURPA). PURPA established a class of generators
known as qualifying facilities (QFs) from which utility companies had to purchase power. This act effectively broke the monopoly over the generation of electricity. The QF market has evolved over the years into a market which includes all non-utility generation.

Soon after the passage of PURPA, two market segments developed, utility owned generation, and non-utility generation. While utility companies still generated their own power, they had to purchase any non-utility power that was less expensive than the power that could be generated in the utility company's own facilities. This gave all generators the incentive to develop ways to generate electricity less expensively.

The drive for less expensive generation has spurred a batch of technological breakthroughs in the electric generation industry. Today, many small generation facilities are able to generate electricity more efficiently and less expensively than the large utility owned facilities of yesterday. Most economies of scale in the electric generation industry have disappeared.

The demise of the economic advantage of utility owned generation leaves no reason why utility companies, or any generator for that matter, should have the right to produce electricity. Today, few would argue that the production of electricity should not be decided by the competitive market.

The emergence of the competitive market reduces the need for undue bureaucratic intervention in the allocation of costs. The forces of the competitive market will internalize all the costs associated with generation. These costs may include: capital expenditure costs, operation and maintenance costs, and environmental costs. The market will allow the prices of electricity to be set based on the principles of supply and demand. This process will present consumers with accurate price signals thus ensuring that the least-cost electricity is procured with little
direction from the regulators.
TRANSMISSION AND DISTRIBUTION MONOPOLY

Disaggregating generation from transmission and distribution activities and placing it in the competitive market makes economic sense. Utility companies, however, should still maintain a regulated monopoly on the transmission and distribution activities of the electric industry.

While the economies of scale have dissolved with regard to utility owned generation, transmission and distribution systems still remain natural monopolies. A natural monopoly still arises in circumstances when the most efficient manner of providing a specific service is clearly through a single firm. A transmission and distribution system is a complex system of cables and capacitors which require intensive capital to maintain. The economies of scale are so powerful that it is most efficient if the system is operated by a single firm.

Because of the economic realities present in natural monopolies, the free market would only produce grossly inefficient costs to the ratepayer. Regulation, therefore, is required to maintain efficiency and equitable profits. Such realities indicate that utility companies should maintain their traditional monopoly on transmission and distribution.

The Massachusetts Department of Public Utilities and the Federal Energy Regulatory Commission (FERC) must work together to establish wheeling rates the utilities could charge for the use of their system. These rates should reflect the cost of providing the transmission and distribution service as well as internalizing a regulated rate-of-return for the utility company.

Because of the guarantee of a profit on operations, the utility company will still be required, as it is today, to meet the demand needs of customers in its service territory. This means that the utility company must continue its obligation to serve and take all prudent measures
necessary to fulfill this obligation. The prudent costs incurred in performing these duties should be recoverable through the established wheeling rates.
GENERATION COMPETITION AFTER DISAGGREGATION

With generation activities separate from the transmission and distribution activities of a utility company, there should be no incentive for utility companies to want to wheel only the electricity their generation units have produced. To ensure true competition is achieved, all generation entities must be allowed to compete on a level playing field; no single entity should be benefitted or hindered by regulations.

The Committee’s research indicated that both utility concerns and non-utility concerns have expressed a preference for a competitive market. Moreover, it seems clear that the participants in Massachusetts understand what that concept means. For the record, the Committee notes that all understand that a competitive market is one such that there is so large a number of buyers (utility companies) and sellers (generators) of a homogeneous product (electricity) that no single buyer or seller is large enough to influence the market price.

At present, the DPU has implemented regulations which require a utility company to select the least-cost resources needed to fulfill their demand requirements. The selection options include the utility company’s own generation, other utility owned generation, non-utility generation, and conservation measures. While conservation measures must stand on their own merit, generation options can be evaluated against each other to some extent. However, because utility owned generation is confined by government imposed regulation, it is unable to be truly compared to non-utility generation. The question remains, which is truly least-cost?

The inefficiencies inherent in regulation should not be permitted to hinder the competitive process. Both utility owned and non-utility generation should be allowed to compete in an unregulated market. A free market presents a “level playing field” on which the least-cost generation will be victorious. By allowing both utility and non-utility generation to compete
in an unregulated competitive atmosphere, the market will allow for least-cost electric generation.

Because a competitive market filters out inefficiencies, only the most efficient (cost effective) generators will be selected to provide power. Generators riddled with inefficiency will either make improvements to their performance or go out of business.

By allowing the efficient market place to determine what generators do and do not get selected for service, the cost-plus rate making system is no longer needed. Efficiency, because it reduces costs, will provide a greater margin of profit for the more efficient companies than for the companies which are less efficient. Profit, therefore is based on performance in the market. This is explored in more detail later.
CONTRACTING FOR GENERATION

Utility companies must have a continuing obligation to provide service to anyone wishing to be served. This obligation is implemented because of the very nature of the utility grid system; any person, once connected to the grid, has the ability to receive electricity. The ability of one person to receive electricity affects the ability of others to receive electricity. Because of this fact, utility companies have been historically franchised with an obligation to serve, an obligation that should be maintained even in a competitive market. This obligation to serve demands that utility companies plan for and maintain enough capacity to meet the peak demand of the customers in their service territory.

The Massachusetts Energy Plan demands that energy resources are procured so as to be least-cost. By demanding such goals, the state must, in turn, insist that the proper regulatory guidelines must be established to ensure compliance with a least-cost doctrine.

The long time-frame of the current IRM process interferes with the achievement of the goals sought by the process itself. As of this date, regulations that are adaptable to the rapid pace of the competitive market have not been adopted. While the ideas of IRM are commendable, its functionality in the real world of a competitive market is dubious. The needs of a competitive market demand that participant have the ability to meet customer needs flexibly, efficiently, and timely. The twenty-four months required for the IRM process does not meet any of these criteria.

The state needs to re-evaluate and redefine the regulatory processes so that utility companies can contract with the least-cost generator. Regulations must allow a utility to contract with the least-cost supply source regardless of who owns the unit, what fuel is burned at the unit, where

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26 Massachusetts Energy Plan, at 8
the unit is located or sited, and through whose service territory the electricity must be wheeled.

It would be desirable if the DPU designed procurement regulation in such a way as to take all resources into account as the current procedure does. However, new regulations must allow for timely responses to both short-term and long-term demand. The Committee recognizes the difficulty of this task, but believes it is necessary if inexpensive electric power is to become a reality.

The Market Reform Task Force (Task Force), established in the Massachusetts State Energy Plan, is currently working on a process to replace or streamline IRM. The regulations developed by the Task Force need not be overly burdensome or specific, since those issues can be worked out during the RFP and contracting process. The regulations should act as a guideline or set of parameters within which the utility companies must conduct their business. Much flexibility must be afforded in order to allow the companies to maneuver within the confines of a competitive market. _The Committee suggests to the Task Force that rules and regulations that are developed must enable utilities to enter into flexible contracts with generators in a timely manner._

The Committee believes that these changes, if implemented, would allow for the smooth transition from the semi-regulated generation industry of today, to the freely competitive market of tomorrow. There are, however, some important problems which must be addressed before any such transition can commence.
STRANDED UTILITY INVESTMENTS

The first such problem is the treatment of stranded utility investments. A stranded investment is an asset, such as a large generating facility with a remaining useful life, that a utility company must abandon due to changes in state regulation. These are units which, when constructed, were considered to be prudent investments on behalf of the utility companies.

In a competitive market, some existing utility generation units may no longer be economical. While this is a risk imposed on all generation units, a stranded investment is particularly disturbing for a utility company. A stranded investment subjects a utility company to the potential of a substantial financial loss while exposing the ratepayer to increased costs.

Because utility companies invested in these units at a time when it was prudent to do so, (prudence as defined by the regulatory process) the costs of stranded generation investment should be recoverable in some way. The Committee proposes that the remaining undepreciated book value of the stranded investment be recaptured through transmission and distribution charges. This allows for the recovery of prudent investment costs in a manner allocating costs among market participants.

Another matter that must be addressed before Massachusetts can convert to a competitive generation market is the ability of generators to access a utility company’s system.

REGIONAL TRANSMISSION GROUP

New England is a relatively small market for electricity. Massachusetts comprises approximately forty percent of the load in New England. If Massachusetts is going to venture into the realm of the competitive market without having a transmission pact with the five other New England states, non-Massachusetts firms are going to be able to control what power
and what cost Massachusetts ratepayers are subject to. Accordingly, some coordinating body must be established to ensure non-discriminatory regional transmission access for all generators.

A regional transmission group (RTG) is a body established to institute and administer policies and guidelines for open access transmission through tariffs. The RTG would pro-actively ensure that the future transmission needs to serve loads, wheeling and generation are met. RTGs also serve as a forum for the resolution of disputes regarding transmission access and reliability issues.\(^{27}\)

*The Committee believes that there must be a regional transmission group established in order to assure any transition to a fully competitive market includes fair access to the transmission grid throughout New England.*

The Federal Energy Regulatory Commission (FERC) has established guidelines by which RTGs should be organized and operated. According to the New England Power RTG proposal, the following are seven guidelines which FERC has established for the formulation of RTGs:

1) **Membership and Organization:** ensure broad membership, allowing any entity subject to Section 211 of the Federal Power Act.\(^{28}\)

2) **Decision-Making and Voting:** provide for fair and non-discriminatory governance and decision-making procedures that protect the rights of entities susceptible to market power. The RTG should strive for consensus when dealing with regional grid issues that affect most members.


\(^{28}\)Section 211 of the Federal Power Act pertains to the wheeling authority of electric utility companies.
3) **Coordinated Information Gathering and Planning:** require, at a minimum, the development of a coordinated transmission plan on a regional basis and the sharing of transmission planning information, with the goal of efficient use, expansion, and coordination of the interconnected electric system on a grid-wide basis. This component assures that the economic trade-offs between generation and transmission expansion will be weighed appropriately.

4) **State Input:** provide a means of adequate consultation and coordination with relevant state regulatory, siting, and other authorities.

5) **Resolution of Disputes:** include voluntary dispute resolution procedures. Also, assure that transmission owners cannot exert significant market power or control over non-owners, thus providing FERC the assurance it needs to give appropriate deference to resolutions reached as a result of alternative dispute resolution and that meet the standards of the Federal Power Act.

6) **Obligation to Serve:** ensure that there is an obligation to provide transmission services for other members, including the obligation to enlarge facilities. The RTG should, to the extent possible, specify the terms and conditions under which transmission service will be offered.

7) **Exit Provisions:** include an exit provision for RTG members that leave the RTG, specifying the obligations of a departing member.

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In the formation of an RTG is a complex and time consuming venture, it appears necessary. Massachusetts, and the New England region ever hope to obtain lower cost electricity,
competition must be implemented. Without the RTG, the full implementation of competition is difficult if not impossible. The guidelines established by FERC seem to provide a good framework for the planning and coordination of regional transmission access. In the Committee's opinion, the formation of an RTG under these parameters could benefit the ratepayer during the transition to a fully competitive market.

Currently, there is much discussion taking place regarding the formation of an RTG. At this time, the most promising proposal has been put forth by New England Power. However, because of the many issues that must be resolved, the finalization of any RTG agreement is considered to be unlikely in the near future. Meanwhile, the final problem that need to be addressed is the methodology used to determine the rate-of-return earned by a utility company and generation entities under a newly restructured market.

**RATE-OF-RETURN**

True competition would subject all generation to the forces of the market. Where today, a utility company's regulated rate-of-return (ROR) comes from generation, tomorrow's utility companies will receive a guaranteed ROR from the transmission and distribution (T&D) services provided to wholesale generators.

Currently, as much as three-fourths of a utility companies profits come from generation activities.²⁹ A utility company is allowed to charge rates from which it earns a rate-of-return based on the cost-plus methodology. That is, the utility is able to collect, from the ratepayer, its cost of doing business plus a set rate of return. Under this system, utility companies have no incentive to become more efficient. The greater the cost of prudent operations, the larger the monetary return. A change in the utility structure affords regulators an opportunity to

²⁹Conversations with members of the electric utility industry.
implement a better method by which a utility company earns a rate-of-return.

Utility companies, which have disaggregated generation from their regulated corporate structure and into non-regulated generating units, should be and must be allowed to earn their traditional ROR on transmission and distribution (T&D) services. In exchange for the right to earn a set ROR on T&D services, the utility company will provide generators with nondiscriminatory wheeling rates. The ROR would take into account past regulatory burdens, past prudent investments, and adequately compensate utility companies for their obligation to serve and meet the demand needs of the customers in their service territory.

By doing so, regulators have effectively taken away any favoritism the utility companies would give to their unregulated generation entities. By leaving utility companies with no incentive other than price, regulators will have eschewed the problem of generators being refused access to transmission and distribution systems.

However, the rate-of-return earned on generation activities would have to be redefined. The generation units that have been separated out from the regulated utility structure must compete in the market for the right to generate electricity for T&D. This competitive market should operate similar to the structure that exists today in the non-utility generator market. Each unit competes against the others based on the needs identified by the utility companies. The unit(s) which can best serve the load demanded in the least-cost manner will be contracted by the utility company for power. Instead of the current cost-plus method used for utility owned generation, market forces should determine the rate-of-return earned by all generators.

Under this method, no generator will be guaranteed a rate of return, instead, it will be dictated by performance. The generation units that operate in the least-cost and most efficient manner
will earn a higher return than those generators who are not least-cost or operate less efficiently. The less efficient generators will earn a lower return or possibly no return.

If regulators can successfully address concerns over stranded utility investments, regional transmission problems, and rate-of-return determinants, Massachusetts can benefit from leading the transition toward increased generation competition. By providing this transition period and guidance, regulators will avoid many of the pitfalls that come with changing from a regulated market to one based on a competitive model.
SECTION FOUR: CONCLUSIONS and RECOMMENDATIONS

In this report, the Senate Post Audit and Oversight Committee has presented the policies and actions of the state and federal regulatory bodies governing environmental protection and electricity generation. A logical and plausible framework for introducing increased competition into the wholesale electric generating industry has also been presented by the Committee. Following are the conclusions and recommendations presented in this report.

- The Committee applauds the Department of Environmental Protection and its staff for the rapid and innovative path taken by the agency to comply with the regulations of the CAAA. The Committee finds that the use of market forces to determine the cost of compliance is consistent with the goal of promoting efficiency and thus least-cost compliance.

- The Committee believes the Department of Public Utilities should, once again, review the use of environmental externalities to determine the usefulness of such externalities and the methodologies by which they are determined.

- The Committee finds that the Department of Public Utilities' action in order 93-112 is consistent with previous orders relating to cost which are below the $250 per kilowatt threshold established in the IRM framework. The Committee also urges the Department to issue order 94-23 forthwith so that SO2 compliance costs may be treated appropriately in a timely manner.
• The Committee agrees with the Plan's hypothesis that increased efficiency and diversity will add stability to Massachusetts' energy base, reduce the state's exposure to price fluctuations, and provide state support for competition in the energy marketplace.

• The Committee suggests, rather than focus on streamlining the Integrated Resource Management process, DOER should concentrate its efforts on methodologies that would allow for a transition from a regulated market to a freely competitive market. The Committee concludes that, as other states move toward a more competitive electricity market to solve their woes of high cost electricity, Massachusetts must make at least equivalent strides forward to make a smooth transition into the competitive realm.

The Committee presents several policy positions that it believes are worthy of extensive exploration. These positions are:

• Disaggregate utility owned generation from utility transmission and distribution activities

• Allow utility companies to maintain a regulated monopoly on transmission and distribution services

• Deregulate utility owned generation so that there is a freely competitive generation market

• Permit utility companies flexibility in the generation contracting process
**APPENDIX ONE**

<table>
<thead>
<tr>
<th>US Rank</th>
<th>EPA Region</th>
<th>State</th>
<th>Plant Name</th>
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* Information provided by EPA Region 1.