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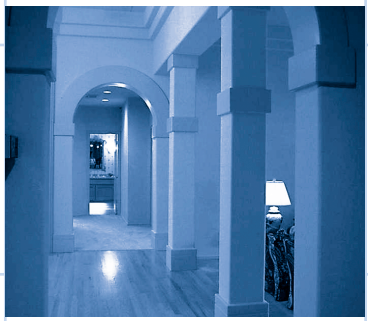
REPORT

Electric Industry Restructuring in Massachusetts:

After the Revolution, the Evolution



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ASSOCIATED INDUSTRIES OF MASSACHUSETTS FOUNDATION, INC.

The Associated Industries of Massachusetts Foundation, Inc., is an educational and economic research organization established by Associated Industries of Massachusetts, the largest nonprofit, nonpartisan organization of employers in the Commonwealth.

The Foundation was created in 1991 to develop in-depth, nonpartisan, fact-based analysis of public policy issues. The Foundation is classified as a Section 501(c)(3) organization under the Internal Revenue Code.

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Electric Industry Restructuring in Massachusetts:
After the Revolution, the Evolution

Winter 2003

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Executive Summary

Introduction

Restructuring is implemented state-by-state with different approaches and timetables.

With the passage of the Massachusetts Electric Industry Restructuring Act in 1997 (Restructuring Act), the Commonwealth became one of the first states in the nation to restructure its highly regulated electric industry. The goals were to establish competition in the marketplace, reduce prices, and allow retail customers to choose among competitive power suppliers.

Recognizing that industry restructuring would be a complex undertaking, the Legislature established a seven-year transition period through February 2005, to allow adequate time for competitive wholesale and retail markets to develop. In other words, after "revolutionary change" would come "evolutionary change" to achieve a fair, reliable and well-functioning marketplace.

Wholesale markets are federally regulated, while states are responsible for retail markets.

With the transition period more than half over, this White Paper was prepared under the sponsorship of the Associated Industries of Massachusetts Foundation to provide an overview of the restructuring progress to date. The paper also serves as a guide to legislators and policymakers in fine-tuning policies so that restructuring goals can be fully attained.

Four topical areas are addressed:

- **Electricity as a Commodity** and its importance to the state's economy as well as its high cost in comparison to other regions – which was the catalyst for restructuring.
- **Revolutionary Industry Changes** that altered the business of generating, distributing and selling electricity. The Restructuring Act established guidelines for utility companies to unbundle services, divest generating units, reduce rates to all consumers, and open generation service to competition. At the wholesale level, the federal government guided the development of competitive markets administered by ISO New England.
- **Consumer Benefits of Restructuring** which thus far include substantial consumer savings from mandated rate reductions, aggregated savings and lower retail prices, the construction of numerous power plants, energy efficiency programs, cleaner air from more efficient power plants, and the emergence of competitive retail markets.
- **Near-Term Evolutionary Challenges** that must be addressed to ensure that the success of restructuring continues and is maximized for all consumers. These challenges include the expiration of the seven-year transition period in the absence of robust retail markets for small customers, the need for transmission infrastructure improvement, and the importance of maintaining power plant fuel diversity.

Electricity as a Commodity

Since the early 1970s, electricity consumption in Massachusetts has almost doubled, fueling the Commonwealth's economic growth. Historically high electricity costs, however, have put the state at a competitive disadvantage and influenced Massachusetts' movement towards industry restructuring. The unique characteristics of electricity production, transmission and distribution have provided unique challenges to industry restructuring.

Massachusetts' high cost of electricity was the catalyst for industry restructuring.

Revolutionary Industry Changes

The Restructuring Act required utility companies to "unbundle" or separate electric service into three basic components – generation, transmission and distribution – and allowed all customers to choose their electricity suppliers beginning on March 1, 1998. Generation companies now compete in an open market, while transmission and distribution companies continue to operate as regulated monopolies. A competitive wholesale electricity marketplace was established by ISO New England, the independent entity approved by the Federal Energy Regulatory Commission (FERC) to oversee and administer the region's wholesale market. As a result of these revolutionary industry changes, Massachusetts is now experiencing the slow emergence of a promising competitive retail market.

Consumer Benefits of Restructuring

Through conservative and practical decision-making, Massachusetts has experienced considerable stability and success in its restructuring efforts thus far in comparison to other states, most notably California. These decisions included:

The Legislature's prudent approach to restructuring is providing a stable transition to competitive markets.

- **Streamlining Power Plant Permitting Process** that allowed market forces, instead of the government, to determine the need for new plants while maintaining a rigorous – yet streamlined – environmental permitting process for siting new plants.
- **Allowing Utilities to Enter into Long-Term Contracts** for purchasing power on the wholesale market. While both California and Massachusetts encouraged utilities to divest (sell) generation, Massachusetts allowed utilities to determine how to buy power for their consumers through a combination of fixed-priced, long-term contracts, as well as potentially more volatile "spot market" purchases.
- **Incorporating Regulatory Flexibility** in adapting to changing market conditions. Massachusetts regulators pragmatically allowed transitional supply service prices to change to reflect changing market conditions.

Implementation of the Restructuring Act and prudent decision-making have resulted in tangible economic and environmental benefits to all electric consumers including:

- **Savings from Mandated Rate Reductions.** According to the Massachusetts Division of Energy Resources, all consumers have garnered $1.7 billion in cumulative savings through December 2000 (latest data available) from a combination of mandated rate reductions and net revenues from the sale of generation facilities even accounting for fuel adjustment charges and inflation.

All consumers have saved $1.7 billion through December 2000.

Aggregation is providing millions of dollars in additional savings for smaller consumers.

- **Savings from Aggregation.** Municipal governments and nonprofit organizations are allowed to aggregate purchases in order to obtain volume discounts from power suppliers. For example, the Cape Light Compact contracted with a competitive supplier to serve 45,000 customers in 21 communities with potential savings of approximately $2 million during 2002. An electricity-buying program offered through the Massachusetts Health and Educational Facilities Authority (HEFA) to over 400 nonprofit organizations has current "life of contract" savings of approximately $100 million.
- **Enhanced Electricity Supply and Infrastructure.** Twenty-two new generating plants have either become operational or begun construction in New England since the Restructuring Act was signed into law, representing an increase of approximately 40% of the region's supply. The promise of competitive markets in Massachusetts and other states in the region attracted national energy companies to purchase utilities' divested units and to invest in new ones. It also encouraged natural gas pipeline companies to expand the pipeline network into New England to serve new gas-fired plants. Since 1995, the total amount of energy infrastructure investment in New England has been roughly equivalent to the entire budget of the Big Dig – financed by private investment, not ratepayers. This increased power supply has helped put downward pressure on wholesale electricity costs – benefiting all consumers.

New power plants are fueled by natural gas and are 10 times cleaner than some existing fossil-fueled plants.

- **Cleaner Air.** All new power plants that have been built or under development are natural gas-fueled. Through a combination of advanced technology and the basic properties of natural gas, these plants are twice as efficient and up to 10 times cleaner than other fossil-fueled plants. This means that there are virtually no emissions of sulfur dioxide or small particulate matter and far lower emissions of nitrogen oxides and carbon dioxide for every kilowatt-hour of electricity produced – significantly reducing contributors to acid rain, smog, and global warming.

Distribution companies have invested in system upgrades for more reliable service.

- **Continued Energy Efficiency.** From1997 through 2001, about $500 million was collected from ratepayers for energy efficiency programs and an estimated $110 million is expected to be collected annually between 2002 and 2007. Overall, energy efficiency programs can positively affect the cost of electricity for households, the wholesale price of electricity, and reduce air pollution. In 2000, with ratepayers paying in $168 million, energy efficiency efforts saved participants over $19 million immediately, with an additional projected savings over the life of the energy-efficient equipment installed of $295 million.
- **Improved Service Reliability.** The Department of Telecommunications and Energy established service quality standards to measure the performance of the still regulated distribution portion of the electricity business. Service quality standards have worked to penalize substandard service and have resulted in over $100 million in investments that were made by local distribution companies to improve service reliability.
- **Emerging Competitive Retail Markets.** Over the past year, a competitive retail market has emerged serving both large and medium-sized commercial and

industrial (C&I) customers. As of June 2002, 44% of the state's large C&I customer load was supplied by competitive suppliers as well as 18% of the state's medium C&I load – providing savings to over 7,300 customers in those sectors. However, retail markets for small commercial and residential customers have been considerably slower to develop.

Over 40% of the state's large C&I customers now purchase electricity from competitive suppliers.

Near-Term Evolutionary Challenges

Despite these significant accomplishments, regulators and/or the Legislature may have to consider additional evolutionary changes to fully attain restructuring goals. While not providing specific recommendations, the list below identifies the need for possible action.

- **Transition Period Expiration without a Robust Retail Market for Smaller Customers.** While a competitive retail market for medium and large C&I consumers is emerging, a robust competitive market for residential consumers and small businesses remains elusive. As of June 2002, competitive suppliers supplied only 2% of the state's residential load and 11% of small C&I load. This is because transitional retail rates under the Restructuring Act (through either standard offer or default service) have been, for the most part, at or below market-priced wholesale generation costs. This has discouraged competitive suppliers from doing business in the state because it has been either difficult to beat the regulated prices or too expensive to market to smaller customers.

  A fairly short period of time remains for the market to develop before transitional rates end. In early 2001, the Massachusetts DTE opened an investigation into Competitive Market Initiatives (D.T.E. 01-54) to assess ways to enhance competitive supplier marketing efforts, and opened an investigation into the Provision (Pricing and Procurement) of Default Service (D.T.E. 02-40) in mid-2002. Choice and competition for small C&I and residential customers remain ongoing challenges.

- **Improvements to Reduce Transmission Constraints.** New England's electric transmission system has constraints, wherein electricity cannot be economically delivered to some areas during peak demand periods. According to ISO New England, transmission "congestion" between 2002 and 2007 could cost Massachusetts' consumers millions of dollars each year. Today, all congestion costs are shared equally among consumers throughout the region. However, starting in 2003, customers in "congested" areas may pay more for electricity – which will increase electricity prices in some areas of the state. Each New England state, including Massachusetts, should consider ways to either streamline the permitting process for new transmission or encourage investment in transmission infrastructure, while maintaining appropriate environmental standards. In addition, proposed federal rulemaking on standard market design currently under review to standardize market rules on a national basis is designed to influence greater transmission investment.

- **Declining Fuel Diversity.** Fuel diversity for generating electricity helps ensure stable and reliable electricity markets. Roughly 50% of the region's electricity will

Despite many accomplishments, policymaker action may be required to:

More fully develop retail markets,

Reduce transmission constraints,

Address decreasing fuel diversity.

soon be generated by natural gas. Natural gas prices have historically been volatile, meaning the region will become more susceptible to price swings. In addition, diversity of supply is also being threatened by increasing environmental regulation of the state's coal-fired power plants, which if closed, would cost Massachusetts consumers about $200 million every year in additional fuel charges. Unplanned power plant retirements could also impact power plant fuel diversity. The development of renewable energy supplies to increase fuel diversity was encouraged by the Legislature through the creation of the Massachusetts Renewable Trust Fund and financed by a charge added to consumers' bills to assist renewable projects in achieving commercial viability.

Conclusion

To date, the Restructuring Act has been largely successful. Despite this success, action by policymakers may be necessary to keep restructuring efforts on track and foster greater competition. This should not be construed as an opportunity for a "sea change" in the evolution of industry restructuring. Indeed, the results thus far indicate no basis for a major change. Rather some fine-tuning is required to remove barriers to develop a more efficient market and create an environment that encourages greater customer choice.

I. Electricity as a Commodity Vital to Massachusetts' Economic Growth

Since the "energy crisis" of the early 1970s, electricity consumption in Massachusetts has almost doubled, as shown in **Figure 1**, which illustrates the relationship between increasing electricity consumption and the state's economic growth.

Electricity is the "fuel of choice" for our high-tech economy.

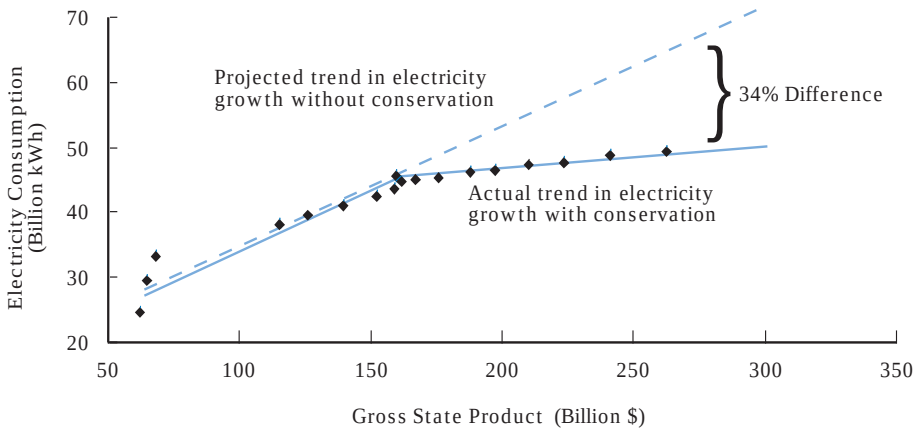
Electricity consumption has increased significantly in all economic sectors. Residential electricity usage, comprising about one-third of the state's total consumption, has dramatically increased due to population growth, larger homes, and increased usage of air conditioning. Almost half of the state's electricity is now consumed by the commercial sector, a reflection of the region's transformation to a service-oriented economy. The industrial sector consumes substantially less electricity than other manufacturing states due to the Commonwealth's highly energy efficient high-tech industries.

As Massachusetts has become more energy efficient, the rate of electricity growth has slowed. Conservation programs and equipment efficiency improvements have helped reduce electricity demand by about one-third in comparison to what it might otherwise have been.

Economic growth and electricity consumption go hand-in-hand.

Conservation programs help but do not stop growth in electricity demand.

Figure 1: Massachusetts Economic Growth and Electricity Consumption



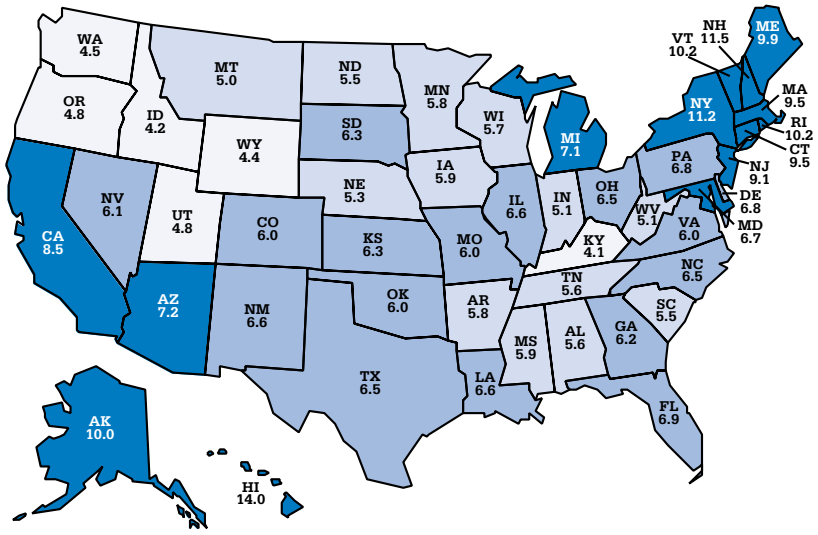
Source: Energy Information Administration, U.S. Department of Energy, U.S. Bureau of Economic Analysis

The Catalyst for Restructuring

In 1997, when the Restructuring Act was passed, Massachusetts had the fifth highest average retail electricity price in the country. These high electricity prices not only created significant adverse effects on consumers, but prevented some Massachusetts businesses from competing with other companies located in lower electricity cost regions of the country.

As shown in **Figure 2,** many states that compete with Massachusetts for high-tech manufacturing and research jobs continue to have significantly lower electricity prices, giving them an important edge in both business and economic development efforts.

Figure 2: Average Overall Electricity Prices by State (cents/kWh – Year 2000)



Source: Energy Information Administration, U.S. Department of Energy

The dramatic price disparity between states is the result of numerous regional differences. In Massachusetts, some of the reasons for high electricity costs are as follows:

- **New England is at the End of the Energy Pipeline.** The region is totally dependent on fossil fuel imports. With no indigenous fossil fuel resources of its own (such as oil, coal, or natural gas), the region is distantly located from coal mines, gas wells and petroleum refining facilities and therefore must pay more to transport fuels into the region.
- **High Cost Region.** The Northeast – particularly metropolitan Boston – has a high cost of living that translates into higher prices for labor, housing, transportation, health care, and electricity.
- **Lack of Federal Subsidies.** The Northeast does not enjoy federal government subsidies other regions do, such as portions of the West, South and Southwest, originally intended to help electrify rural America.

The Legislature initiated restructuring with the explicit goal of lowering prices for all residents and businesses.

It was the state's high electricity costs that influenced Massachusetts' movement towards competition through restructuring. While Massachusetts' electricity prices will most likely remain higher than many states due to the reasons listed above, the Legislature initiated restructuring to lower the price of electricity. This was done by introducing competition into the electricity generation portion of the industry and by

providing customers the opportunity to choose their retail electricity supplier – efforts designed to increase competitive market forces.

The Legislature had reasonable expectations given that, among other independent agencies, the U. S. Department of Energy (DOE) projected that retail competition nationwide would save consumers about $20 billion a year – a savings of about $230 (25-30%) per year for a family of four. Moreover, long-term experiences in other recently restructured industries were also positive. Within the natural gas, airline, telecommunications, trucking and railroad industries, competition brought real customer savings of 12 to 45 percent within five years and 25 to 60 percent within 10 years of restructuring – demonstrating that savings take time to accrue.

Producing and Delivering Electricity

The generation and transmission of electricity have unique properties that provide challenges to restructuring.

The electric power industry is the only major industry to be restructured that involves a manufactured commodity essential to America's infrastructure. Electricity operates homes, offices, and industries; provides communications, entertainment and medical services; powers computers and the Internet and fuels various forms of transportation. Americans have come to depend on and expect a reliable supply of electricity.

The electric power system is distinct from other energy sources such as oil and gas in two important ways:

1. **Electricity cannot be stored.** As a result, it must be generated, transmitted, and distributed the moment it is needed.
2. **Electricity flows over the paths of least resistance**, meaning it is very difficult to direct it over a specified path, such as a specific transmission line, like oil or gas in a pipeline. Electricity will travel down whatever paths are made available to it.

To reach consumers, electricity must travel from power plants through miles of transmission and distribution lines. Throughout the U.S., the production and transmission of electricity is organized and managed on the basis of regional grids or power pools – the only exceptions being the large states of California, Florida, New York, and Texas.

New England's electric power system consists of more than 350 generating facilities connected by more than 1,800 miles of high-voltage transmission lines that transport power to about six million electric customers throughout the region. The system is operated as a single regional control area with interconnections to Canada and New York in order to transfer power as needed and to ensure reliability. The system was designed and constructed as a fully integrated network, allowing New England generators to produce electricity that freely flows to any point on the system, serving all New England electricity consumers.

These unique characteristics of electricity as well as the interconnected "regional" structure of the industry provide challenges to Massachusetts as well as other states undergoing restructuring.

II. Revolutionary Industry Changes

Background

Interstate transmission and wholesale electricity sales are regulated by FERC.

State regulators such as the Massachusetts DTE regulate in-state retail transactions.

Congress has encouraged competition in wholesale electricity markets, which has influenced the trend toward retail competition in 17 states.

Prior to restructuring, the electric industry was a vertically integrated monopoly with utility companies owning power plants, transmission systems and distribution networks in service territories in which no other entity could compete. The Federal Energy Regulatory Commission (FERC) regulated interstate transmission and wholesale electricity transactions, while state regulators such as the Massachusetts Department of Public Utilities (now called the Department of Telecommunications and Energy, or DTE) regulated in-state markets and retail transactions.

Until the late 1960s, electric industry regulation required a "light-handed" approach as increasing electricity demand, technological innovations and the construction of larger, more efficient power plants ensured that costs remained stable or declined with economies of scale. Utilities were rewarded with increased profits without rate increases. Financially, power plants were operated on a rate-of-return basis – meaning that once determined to be prudent by regulators, ratepayers paid for them regardless of operational status, absent negligence in performance.

However, starting in the 1970s, market forces changed dramatically. Rapid inflation, higher nominal interest rates, and unexpected increases in the price of crude oil combined with construction delays associated with large nuclear plants caused electricity prices to increase dramatically. According to FERC, average residential rates increased by 25% (after adjusting for inflation) between 1970 and 1985, while average industrial rates increased by 86%.

These higher electricity costs provided a commercial opportunity for new forms of generation from non-utility providers. Congress recognized the necessity of promoting a more diverse range of energy resources and through provisions contained in the Public Utility Regulatory Policies Act of 1978 (PURPA) mandated that electric utilities provide a market for the output of non-utility power plants that met certain fuel, ownership and efficiency standards. In the wake of PURPA, a new independent power producer (IPP) industry competing for opportunities to sell power to electric companies matured. The emergence of this competitive power industry helped end the notion that electric power production was a natural monopoly.

Thereafter, competition in wholesale markets was essentially promoted with the passage of the Energy Policy Act of 1992 (EPACT) which began the process of opening transmission access by mandating that utilities allow other generators the use of their lines. Thereafter, FERC Orders 888 and 889 required open and equal access to all utilities' transmission lines for all electricity producers, thus facilitating state restructuring of the electric power industry to allow competition at the retail level.

By 1996, many states had begun to examine proposals to restructure the electricity industry, knowing it would be a long process. Among the states forging ahead, differing approaches and timetables were adopted. Some have asserted that the process has yielded a "crazy quilt" record of effectiveness. But since the late 1990s, the process has been moving forward in many states.

Currently, 17 states and the District of Columbia are actively restructuring their electric industries. The initiatives occurring in those states are benefiting customers, power suppliers and regulators by revealing what works – and what doesn't – in newly competitive markets.

Massachusetts' Restructuring Act

After three years of deliberation, the Massachusetts Electric Industry Restructuring Act became law in November 1997 and the Commonwealth became one of the first states in the nation in March 1998 to restructure its electric industry.

The guidelines for the restructured industry were:

- **Divestiture of Generation Assets/Creation of Merchant Plants** – In order to avoid a concentration of market power and to minimize transition costs, electric utilities were encouraged to divest (sell) their generation assets (power plants) in an auction process in exchange for the right to recover capital and contractual costs incurred under the old regulatory system. Buyers (and owners of subsequently constructed plants) now operate plants on a "merchant basis" – meaning that if they do not operate or perform as expected (for any reason), ratepayers are no longer financially responsible. This means that financial risk has been totally shifted from the consumer to the power plant owner.
- **Transition Costs** – Transition costs are the generation investments and contractual obligations of utilities that were approved by regulators prior to restructuring – which would have been recovered at fixed rates over time under the old regulatory system. In Massachusetts, transition costs are being recovered over time through a customer bill charge as part of the transition to full retail competition. Funds from the sale of generation assets have been applied to reduce transition costs.
- **Retail Choice of Power Supplier** – As of March 1, 1998, all customers were provided the option to choose their generation (power) supplier – unlike some states that adopted a phase-in approach for different customer sectors. For those customers not choosing a retail supplier, the following services are available through local distribution companies:
  - **Standard Offer Service** – This is a generation supply service to existing customers as of March 1, 1998 through February 2005, intended to allow the wholesale marketplace to fully develop before retail rates are set by wholesale market indicators, insulating customers from market price fluctuations. Standard offer rates were approved by the DTE in 1998 with annual escalators and increases permitted for fuel cost increases based on a pre-determined formula.
  - **Default Service** – This service is provided to new customers (after March 1, 1998) that have not chosen a competitive supplier or for existing customers that have switched to a competitive supplier and then back to utility service. Distribution companies purchase supply for default service through periodic competitive solicitations under a procedure established by the DTE.

Power plants now operate on a "merchant basis."

If they do not perform as expected, the stockholder, not the ratepayer, is financially responsible.

A seven-year period was established to allow retail markets to develop.

This approach provided residential and commercial customers with favorable and stable electric rates.

All standard offer consumers received a 15% rate reduction.

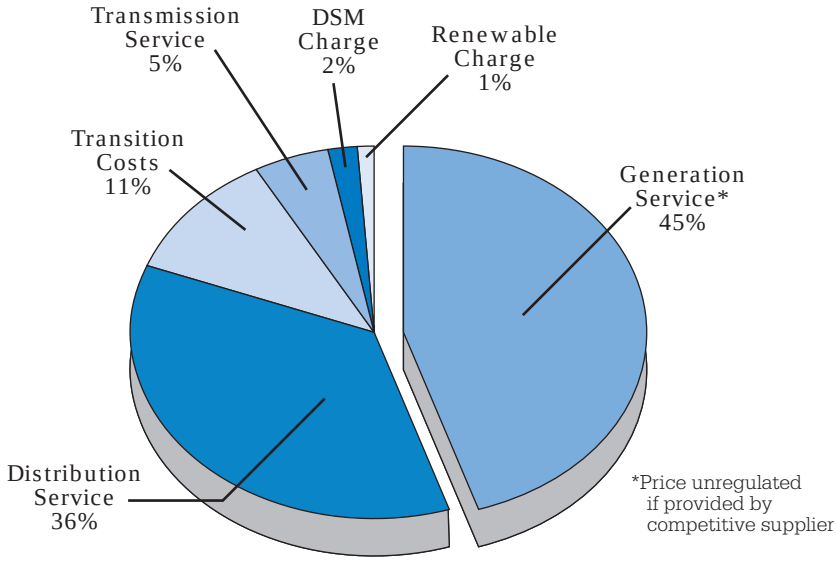
Protections were established for low-income customers.

- **Mandated Rate Reductions** – Since March 1, 1998, standard offer customers have received at least a 10% discount on their total bills. This reduction increased to at least 15% on September 1, 1999. The reduction is off the entire bill, based on 1997 rates adjusted for inflation.
- **Public Benefits Program** – Restructuring guidelines included special discounts for low-income customers with expanded eligibility.
- **DSM and Renewable Charges** – Demand-side Management (DSM) or energy efficiency programs as well as renewable energy activities are funded through special charges on all consumer bills. The Restructuring Act established five years of ratepayer funding for energy efficiency programs, which was extended for an additional five years in 2002 by the Massachusetts Legislature. The Restructuring Act also created a ratepayer-funded Renewable Energy Fund to promote the development and commercial application of renewable energy.

Figure 3 illustrates the components of a sample monthly residential customer bill that reflects the new "unbundled industry." Only the cost of "generation" service is currently unregulated if provided by a competitive supplier. Transmission and distbution service costs continue to be regulated. DSM, transition and renewable ratepayer charges are required under the Restructuring Act.

Ratepayer-funded programs were established to maintain energy efficiency and foster renewable energy projects.

Figure 3: Components of a Sample "Unbundled" Residential Customer Bill



Source: Massachusetts Division of Energy Resources

Table 1 presents a comparison of restructuring efforts in Massachusetts compared to other New England states, as well as states that are viewed as leaders in industry restructuring: Pennsylvania, Texas and California. While California has experienced significant and widely reported problems – as noted throughout this paper – other states have experienced quantifiable success.

Table 1: Comparison of Restructuring Efforts in Selected States

(as of September 2002)

State/Date of Legislation/Summary of Efforts

MASSACHUSETTS (11/97) Retail competition for all customers by 3/98, initial rate cuts of 10% increasing to 15%, generation divestiture encouraged, standard offer service to be offered until 2005, ratepayer funded energy efficiency and renewables programs.

CONNECTICUT (4/98) Phase-in of retail competition for all customers by mid-2000, 10% rate reduction, non-nuclear generation divestiture by 2000, nuclear divestiture by 2004, renewable generation portfolio, ratepayer funded renewable program.

RHODE ISLAND (8/96) Phase-in of retail competition in 7/97 for industrial customers, and 7/98 for residential customers. Standard offer service to be offered until 2009, DSM and renewable customer charges funded through 2012. Generation divestiture encouraged.

NEW HAMPSHIRE (5/96) Phased implementation of retail competition for all customers by 7/98. To date, some companies have implemented restructuring, while others have not. Final approval for Public Service Company of New Hampshire's restructuring plan in May 2001 included a 15.5% rate reduction and later in 2001 delayed required generation divestiture.

MAINE (5/97) Retail competition for majority of customers by 3/00, divestiture of generation assets required, nation's most aggressive renewables portfolio requiring 30% of generation from renewable sources.

VERMONT No restructuring to date.

PENNSYLVANIA (12/96) Retail competition phase-in: for 1/3 of consumers by 1/99; 2/3 by 1/00; and all consumers by 1/01. Included rate reduction, ratepayer funding of energy conservation programs, divestiture of generation assets not required.

TEXAS (6/99) Retail competition for most customers on 1/02. Rates frozen for 3 years and then a 6% reduction for 5 years. Divestiture not required/ unbundling of services required. Full retail access delayed in several smaller power regions because more time is needed.

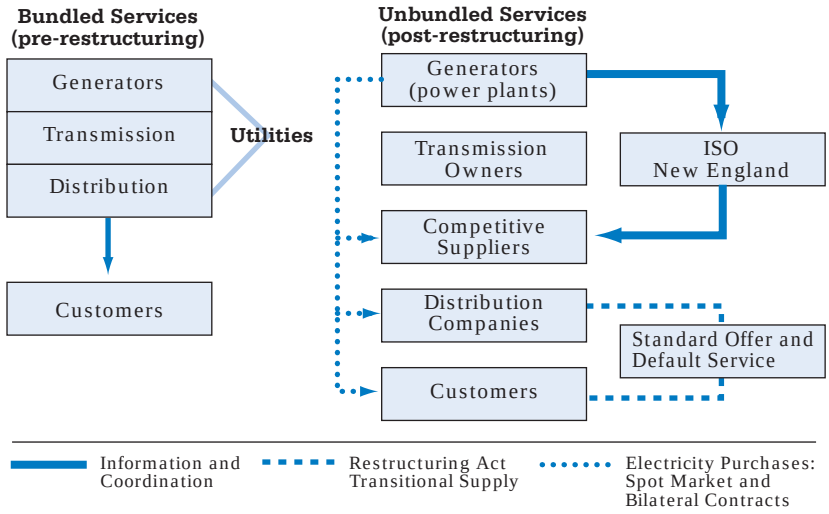
CALIFORNIA (9/96) Retail competition for all customers on 3/98, 10% rate reduction, rate freeze for the transition period through 2002, divestiture of generation assets (except nuclear and hydro), ratepayer funded energy efficiency and renewable programs. Retail choice suspended on 10/01 (about 5% of state's peak load, mostly industrial). Contracts in place, however, valid until expiration.

Source: Energy Information Administration, U.S. Department of Energy

Evolving Restructured Marketplace

The Massachusetts Restructuring Plan called for utility companies to "unbundle" or separate electric service into three basic components: generation, transmission and distribution. Generation and supply related companies, or "competitive power suppliers," compete in an open market. Transmission and distribution companies continue to operate as monopolies under respective FERC and DTE regulation. **Figure 4** shows a comparison of the vertically integrated electricity industry prior to restructuring and a simplified "unbundled" restructured system.

Figure 4: Simplified Restructured Electricity Industry



Redesigned Wholesale Markets (Electricity Generators)

An Independent System Operator (ISO) was formed – an entity not affiliated with any player in the electric industry – to ensure fair and open access to the region's transmission systems and unbiased administration of the markets.

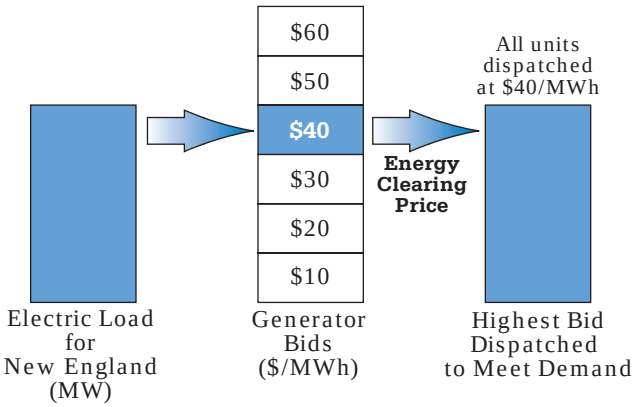
A well-functioning, competitive wholesale market is essential for a successful retail market.

On July 1, 1997, ISO New England assumed full responsibility from the New England Power Pool (NEPOOL) of the day-to-day direction, operation and management of the bulk power transmission facilities in New England. NEPOOL was created in the late 1960s to direct the operation of the transmission bulk power facilities in New England to ensure system reliability. New market arrangements, procedures, rules, systems and products were developed by ISO to support the implementation of a competitive wholesale marketplace in New England. The strong regional operating foundation established by NEPOOL was highly beneficial in ensuring a successful start-up of ISO New England.

The New England wholesale competitive electricity markets were formally initiated in May 1999. The new Internet-based system – a commodity market for electricity – allows generators to submit bids into the marketplace throughout the day. All bids

are received and then ranked from lowest to highest price, matching the expected demand forecast for a given time period. In real-time operations, the highest bid resource dispatched to meet the demand sets the energy clearing price (ECP) or "spot market" price. This is the price paid by wholesale buyers who do not have sufficient bilateral (long-term) contracts to cover their load responsibilities – a situation most prevalent on hot, humid days when electricity demand is high. (Market rules throughout the entire northeastern region of the U.S. prohibit the ECP from exceeding $1000 per megawatt-hour – which is about 30 times higher than average.) As shown in **Figure 5**, this process effectively constitutes "a reverse auction."

Figure 5: Example of New England Wholesale Spot Market Bidding



Independent assessments determined the operation of New England's wholesale marketplace to be within set rules and procedures.

In addition to spot market purchases, wholesale electricity purchases can also be made under bilateral contracts which are longer-term, stable-priced arrangements between buyers and sellers of electricity, which have traditionally been in place in New England – and today still comprise at least 75% of the wholesale market. Massachusetts did not put any unrealistic constraints on market operations with the intent that some market players would take advantage of "spot prices" when beneficial and could also rely on bilateral contracts if desired – an effective risk management approach.

Today, evolutionary changes in the wholesale marketplace governed by ISO New England are ongoing. When the wholesale market in New England was launched, refinements to market rules and systems were expected. Changes will continue to be made in New England as well as other regions as FERC finalizes proposed standard market design (SMD) rules intended to create a level playing field for trading electricity on a national level.

The recent allegations against Enron and other companies of "gaming" the California electricity market last year through unethical conduct, demonstrate the need for a vigilant and independent ISO to administer the marketplace. Independent assessments have shown that the operation of the New England marketplace has been within the established rules and procedures. There are many reasons for this includ-

ing strong oversight, a more stable market based on both bilateral contracts and spot market purchases, the strong operating foundation that NEPOOL transferred to ISO New England, and a system that is not dependent on significant amounts of imported electricity for day-to-day operation.

The approval of an RTO requires prudence so that participating regions realize equal benefits and reliability.

The formation of Regional Transmission Organizations (RTOs) and implementation of standard market design (SMD) is the next step in the evolution of competitive wholesale power markets. By guiding ISOs to become RTOs, FERC hopes to ensure greater coordination in planning and operating power grids, improving access to transmission lines that would enhance competition and in developing larger pools to improve the reliability of the power system. The boards of the ISO New England and the New York ISO filed a joint proposal with FERC to create a single RTO encompassing both regions. However, the boards mutually agreed to withdraw their joint proposal after careful consideration of comments received from the industry as well as a change in schedule for issuance of FERC's Standard Market Design (SMD) final rule. Both organizations will continue to work collaboratively to realize the full benefits of industry restructuring for both regions.

Distribution Companies (Regulated Delivery)

Unprecedented merger activity among distribution companies has occurred over the last several years. In the pursuit of increased efficiency, local distribution companies joined with each other to form bigger corporations. For example, Boston Edison, Commonwealth Electric and Cambridge Electric joined to form NSTAR. Massachusetts Electric and Nantucket Electric, originally owned by New England Electric System, became part of National Grid Group of the United Kingdom, and subsequently Massachusetts Electric combined with Eastern Edison as part of the merger of its parent company, Eastern Utilities Associates into National Grid Group.

Today, there are five investor-owned electric utilities in Massachusetts: Massachusetts Electric, Nantucket Electric, NSTAR Electric, Western Massachusetts Electric (a subsidiary of Northeast Utilities) and Fitchburg Gas & Electric (a subsidiary of Unitil Corporation). Each of these companies provides distribution services to customers.

The Restructuring Act authorized DTE to establish guidelines for Service Quality Standards (SQS) to be included in performance-based rate plans to be submitted by electric distribution companies. In the long term, it was viewed that performance-based rate-making would replace the current system for setting distribution company rates, which guaranteed that distribution companies recover their costs plus a rate of return. Under performance-based regulation, distribution company efficiencies would be rewarded while poor performance would be penalized.

SQS measures distribution company performance in key areas.

The DTE established service quality standards – to serve as benchmarks – for a variety of service quality categories including customer service, billing, safety and reliability. Benchmarks for each category are based on the historical performance of each electric distribution company. A formula for each category establishes a penalty for substandard performance. Credits are given when performance is exemplary.

Service quality standards were implemented to improve customer service and electric distribution reliability.

Emerging Retail Markets (Electricity Supply Service)

Massachusetts has experienced a slow but promising retail competitive market development.

In the early years of restructuring and up until recently, regulated standard offer and default service prices were significantly lower than market-based wholesale electricity generation prices, making it difficult for competitive suppliers to compete in the marketplace. Within the past year, however, market forces as well as regulatory orders concerning restructuring efforts have resulted in beneficial changes to the competitive market.

First, in 2000, the price of default service was uncoupled from standard offer service. Essentially, the number of default service customers rose dramatically – up to 25% of total customers by the end of 2000. Utilities had to purchase additional electricity at higher costs to meet this unexpected demand (default service is available to new customers that have not chosen a competitive supplier and existing customers that have switched to a competitive supplier and then back to utility service). Utilities complained that the required rate, set below the cost of wholesale power, was causing them to lose money on default customer accounts. By uncoupling the prices of the two retail services, DTE required default service prices to be market-based to reflect actual costs and to allow utilities to recoup their expenses.

Second, in July 2001, the DTE, seeking to boost customer participation in the competitive market, issued an order for utilities to release, with customer approval, default customers' information to competitive suppliers including names, addresses, and rate classes.

Lastly, during the winter of 2000-2001, crude oil, and in particular, natural gas prices increased sharply – not just in New England but nationally – and held steady at high levels. As a result, the state's distribution companies were paying higher costs for electricity to serve their customers and were required to sell it for less at standard offer prices. In August 2001, the DTE allowed the increased fuel costs to be passed on to consumers, increasing standard offer rates to more closely match the wholesale market price of electricity.

These evolving changes – along with the lowest wholesale electricity prices the region has evidenced in four years – have increased competitive supplier activity, leading to the development of a competitive retail marketplace.

III. Consumer Benefits of Restructuring

The Legislature's prudent, evolutionary approach to restructuring is providing a stable transition to competitive markets.

The restructuring of the electric industry in the Commonwealth has provided a broad range of financial, efficiency, reliability and environmental benefits to all customers that would not have otherwise been realized under the former regulated system. In addition, the prudent, evolutionary approach to restructuring adopted by the Legislature in 1997 is providing a stable transition to fully competitive markets.

Massachusetts was able to avoid a California-type situation through conservative and practical decision-making prior to and during restructuring that included:

- **Streamlining Power Plant Permitting Process.** Unlike California, the New England States, most notably Massachusetts, allowed market forces, instead of the

government, to determine the need for new plants while maintaining a rigorous – yet streamlined – environmental permitting process for siting new plants, generally achievable within a few years.

- **Allowing Distribution Companies to Enter into Long-Term Contracts.** While both California and Massachusetts encouraged distribution companies to divest (sell) generation, Massachusetts allowed distribution companies to determine how to buy power for their consumers through a combination of fixed-priced, long-term contracts, as well as the potentially more volatile "spot market" purchases. California prohibited long-term contracts, so distribution companies had no hedge against sudden and prolonged increases in spot market prices.
- **Incorporating Regulatory Flexibility into Changing Situations.** Due to the prevalent use of natural gas to generate electricity, the "well-head" prices of this commodity are now driving wholesale electricity costs, not just in New England, but in many other parts of the country. When natural gas commodity prices sharply increased during the winter of 2000, California regulators did not allow utilities to pass along the increased fuel cost to consumers. This "rigidity" was one reason why one California utility declared bankruptcy. In Massachusetts, regulators pragmatically allowed increased fuel costs to be passed along to consumers – as had been common practice prior to restructuring.

All consumers have garnered over $1.7 billion thus far from mandated rate reductions.

Customer Savings

Electric industry restructuring has provided economic benefits to consumers through mandated rate reductions, the ability to form aggregated groups to buy electricity, and from lower retail rates.

Rate Reductions

According to the Massachusetts Division of Energy Resources, consumers garnered $1.7 billion in cumulative savings from March 1998 through December 2000 (savings through 2001 are not yet available) through mandated rate reductions and net revenues from the sale of generation facilities.

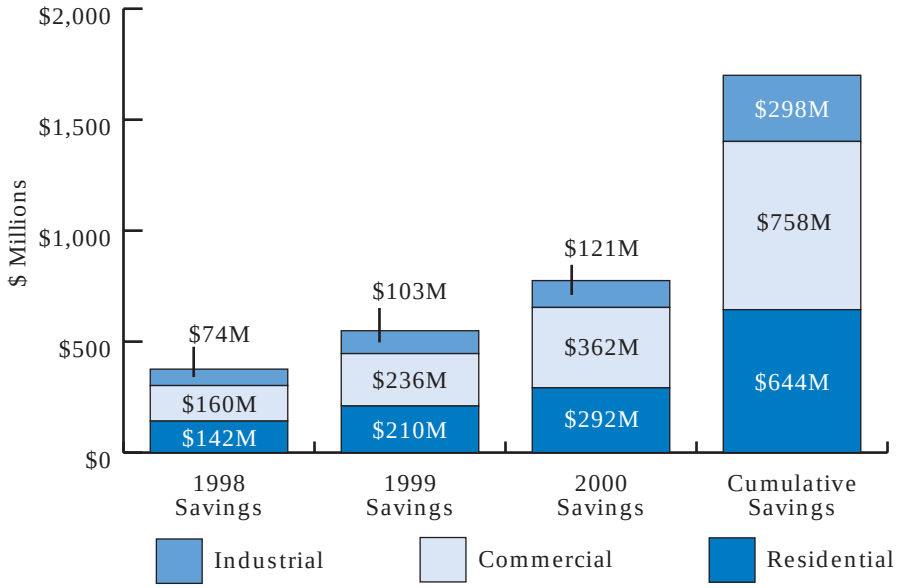
At the outset of industry restructuring, Massachusetts investor-owned distribution companies were required to reduce rates to customers on standard offer service by 10% from 1997 rates by March 1998, and an additional 5% on or before September 1999. The 15% rate reduction does not apply to default service customers or to customers that switch to competitive suppliers. **Figure 6** illustrates cumulative savings attributed to the mandated rate reductions through December 2000, accounting for inflation.

Savings from Aggregation

The Restructuring Act allows for the formation of different types of aggregated groups to buy electricity. Aggregation enables consolidation of energy purchases into larger buying blocks to help smaller consumers obtain lower prices.

The DTE has approved one municipal group thus far – The Cape Light Compact, which is comprised of 21 towns on Cape Cod, Barnstable County and Martha's Vineyard, representing 185,000 customers – to aggregate electricity purchases for public

Figure 6: Consumer Savings from Mandated Rate Reductions Have Been Significant



Sources: Massachusetts Division of Energy Resources, 2000 Market Monitor; Electric Industry Restructuring, February 2002

buildings and interested customers. The group recently obtained regulatory approval for a competitive supplier to serve 45,000 default service customers. In addition to an estimated $2 million in cost savings for 2002, the agreement offers consumer options for "green power" or renewable energy.

Other types of private and nonprofit aggregated groups have also been formed to increase the buying power of participating customers. Examples of such groups include the Massachusetts Health and Educational Facilities Authority (HEFA), the Massachusetts Municipal Association, and chambers of commerce. Through the PowerOptions, Energy Purchasing Group, HEFA members – including hospitals, colleges and universities, human service agencies and cultural institutions – will save about $100 million in electricity costs over the life of a five-year contract, which ends in March of 2003.

Municipal and non-profit organizations can "aggregate" electricity purchases to obtain volume discounts.

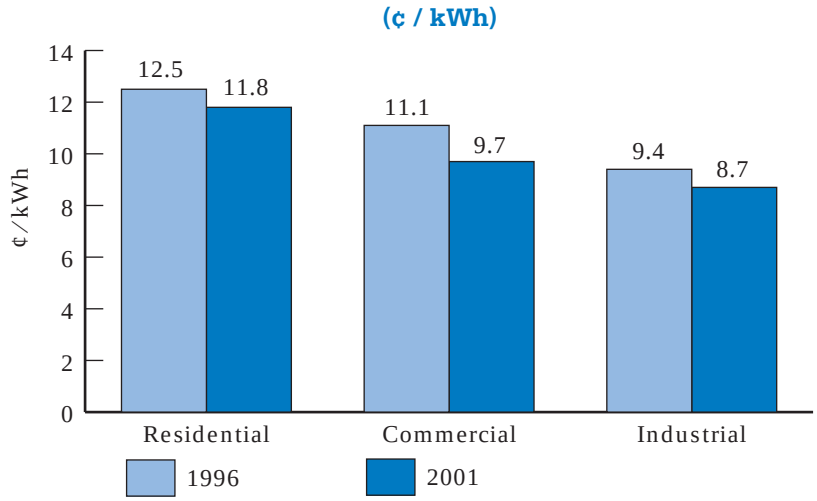
Participation in HEFA's aggregation group has saved Boston Medical Center $3.7 million through March 2002.

Lower Retail Prices

Industry restructuring efforts have increased marketplace efficiencies that have helped reduce retail electricity prices. The impact, as shown in **Figure 7**, has been significant. From 1996 to 2001, Massachusetts' residential electricity prices decreased almost 6%, commercial sector prices over 12%, and industrial prices over 7%. These values include inflation, default and municipal customers and fuel cost adjustment.

As transition costs decrease and competitive market forces strengthen over time, electricity prices in the Commonwealth should be lower than they would have been otherwise.

Figure 7: All Inclusive Massachusetts Average Electricity Rates Before and after Restructuring.
(includes inflation adjustment, default customers, municipal utility customers, and fuel cost adjustment)*



** The inclusion of these adjustments means that this figure cannot be directly compared with the 15% electricity rate reduction required under the Restructuring Act which began in 1998.*

A study of Pennsylvania's competitive electricity market estimates that prices will be 10 to 20% lower than they would have been otherwise.

A study of Pennsylvania's deregulated electricity market – performed by the Pennsylvania Department of Revenue in 2001 – shows that prices in that state are expected to be 10 to 20% lower than they would have been under the regulated monopoly system. Furthermore, the study projected that restructuring will help create 36,000 more jobs, $1.4 billion more in personal income, will add $1.9 billion to the gross state product by the year 2004, and will save consumers nearly $3 billion. There is no reason to believe that Massachusetts will not benefit from similar savings and other associated economic benefits once restructuring is fully complete – commensurate with the economic and population differences between the two states.

New Power Plant Construction and Development

Because of restructuring, more power plants have been built in New England over the past five years than at any time in recent history.

Maintaining sufficient generation capacity is critical for the electric system's reliability. New England has attracted investment in new generation capacity, which has kept pace with the region's growing demand for electricity. In the absence of restructuring, it is very unlikely that over 10,000 MW of new capacity – or more than 20 power plants – would have come on-line, begun construction or been proposed over the past several years in New England.

Restructuring has provided more incentives for generation companies to build power plants at no risk to consumers – and for natural gas companies to build pipelines necessary to supply fuel to the plants. These new plants are or will provide enough power to light up a major metropolitan area with 9.5 million homes. As a result, New England's electricity supply is sufficient to meet the region's near-term electricity needs.

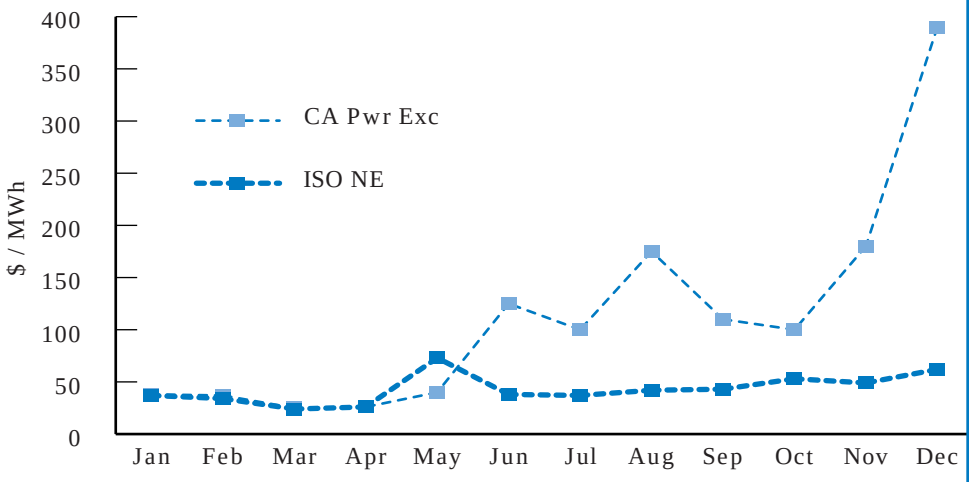
The bottom line for consumers is that there is more supply than demand, which has helped put downward pressure on wholesale electricity costs during peak demand periods, which has benefited all consumers.

For instance, as shown in **Figure 8**, during the first year of wholesale market operation, hourly New England Energy Clearing Prices (ECP) exceeded $100/MWh only 1% of the time. Moreover, hourly ECPs were below $40/MWh up to 90% of the time. This behavior was drastically different than in the California market where there was a severe capacity shortage.

While New England's power supply is adequate to handle electricity demand in the near-term, more generating plants will be needed to keep up with increasing demand and to replace inefficient or retired plants in the future.

Increased supply keeps wholesale prices stable.

Figure 8: Stable New England Wholesale Electricity Prices in 2001



Source: ISO-New England

Energy Efficiency Programs

The Restructuring Act established five years of funding for energy efficiency programs through a ratepayer-energy-efficiency charge – roughly 3% of a customer's annual electricity cost. In 2002, the Massachusetts Legislature extended funding for an additional five years.

By reducing demand during peak usage periods, energy efficiency programs contribute to system reliability in terms of supply adequacy within a particular area or region and can enhance reliability of local transmission and distribution networks. The programs also help avoid higher wholesale energy clearing prices. According to the Massachusetts Division of Energy Resources, in 2000 these efforts:

- Improved reliability and lowered wholesale electricity prices through demand reduction by nearly $6 million;

Ratepayer-funded activities help increase reliability, lower wholesale prices, and improve air quality.

- Saved over 220,000 participants a total of over $19 million on 2000 electric bills – projected to increase to approximately $295 million over the lifespan of the installed measures;
- Cost 55% less than the amount needed to buy electricity over the life of installed energy efficiency measures.

Through 2001, over $500 million was collected from ratepayers for energy-efficiency investments. An estimated $110 million is expected to be collected annually between 2002 and 2007.

Improved Air Quality

Because of current economic and environmental benefits, abundant supplies and infrastructure enhancements, natural gas has become the fuel of choice for electricity generation both in New England and elsewhere. Natural gas-fired, combined-cycle plants offer extremely high efficiency, clean operation and low capital costs. The chemical characteristics of natural gas also result in lower emissions of some pollutants on a per-unit-of-production basis than other generating technologies. The combustion of natural gas emits almost 5 times less nitrogen oxide, 30 to 44% less carbon dioxide and no sulfur dioxide compared to either oil or coal.

New Power plants improve air quality from the clean combustion characteristics of natural gas as well as technological efficiency.

Ratepayer-funded energy efficiency activities authorized by the Restructuring Act also reduce the amount of air polluting emissions released by electricity generating units by reducing electricity demand. According to the Massachusetts Division of Energy Resources, energy efficiency efforts in 2000 resulted in the reduction of 705 and 253,100 tons of nitrogen oxides and carbon dioxide respectively – equivalent to over 50,000 cars – and 1,405 tons of sulfur dioxides – equivalent to the burning of about 100,000 tons of coal.

Retail Markets For Large Customers

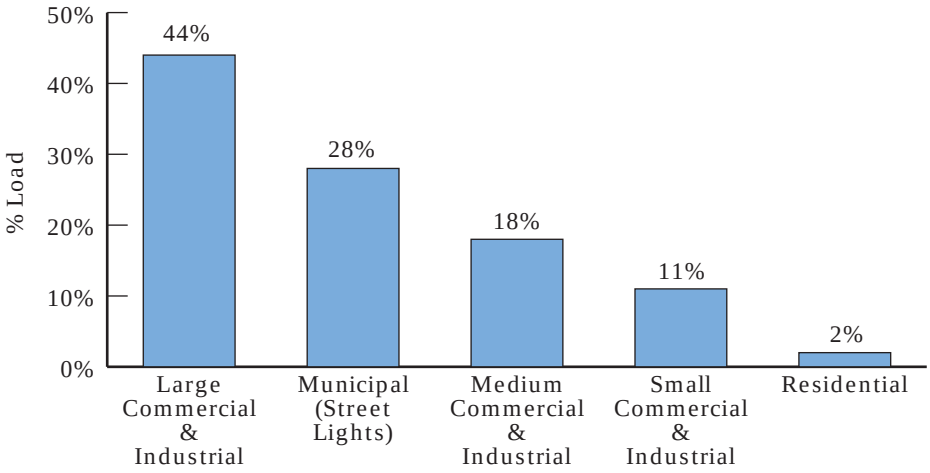
The competitive retail market is developing slowly but surely for large customers. Over 40% of the state's large commercial and industrial (C&I) load is now supplied by the competitive retail market, an increase of almost 100% since a year ago. For the medium C&I sector, approximately 18% of the load is provided competitively, an increase of almost 500% since last year. In contrast, competitive retail suppliers currently supply only 11% of the state's small C&I load and 2% of the residential load.

Competitive retail markets are developing for large customers.

On the other hand, while only about 3% (or 80,000) of the state's 2.5 million customers have selected a competitive supplier (with the remaining choosing either default or standard offer services through their local distribution company), their combined electricity usage is equivalent to almost a quarter of the state's total electricity load. Shown in **Figure 9** is the percent of load for each sector currently purchasing electricity from the competitive market.

Currently, over 40% of C&I load is supplied by competitive suppliers – an increase of about 100% in one year.

Figure 9: Load Served by Massachusetts' Competitive Retail Marketplace (as of June 2002)



Source: Massachusetts Division of Energy Resources, Electric Customer Migration Data, August 2002

IV. Near-Term Evolutionary Challenges

With the exception of continuing the customer energy efficiency charge through 2007, the Legislature has not yet found a need to amend the Restructuring Act, which has thus far provided a solid, yet flexible framework for the evolution of a competitive electric industry in Massachusetts.

However, after four years into the restructuring process, legislative and/or additional policymaker action may soon be considered to ensure restructuring efforts remain on track: namely, to address the possible expiration of the seven-year transition period without a robust competitive retail market for small customers, the need for maintaining fuel diversity for electricity generation, and the need for streamlining transmission infrastructure improvement.

Policymakers will have to consider changes to the evolving restructured industry.

The fact that legislative action may be necessary should not be construed as an opportunity for a "sea change" in the evolution of restructuring – indeed there is no basis for one. Rather, the Restructuring Act may need fine-tuning to ensure attainment of restructuring goals.

The following are key challenges that are on the horizon. None involve the wholesale market as it falls under federal jurisdiction. Specific approaches/actions to these challenges are not proposed herein. Rather, the need for potential DTE and legislative involvement is posed in terms of a series of questions.

Lack of Robust Competitive Market for Small Customers

The development of a robust, retail competitive market has remained elusive for small customers. Suppliers have found it very difficult to offer prices at or below the standard offer service price provided by the distribution companies since the initiation of restructuring on March 1, 1998. The standard offer price was set, with yearly escala-

A robust, retail competitive market has remained elusive for small customers after four years of effort.

tors in 1998 and reflects the mandated 15% rate reduction adjusted for inflation. Moreover, the standard offer price was designed to protect consumers from fluctuations in the developing wholesale market.

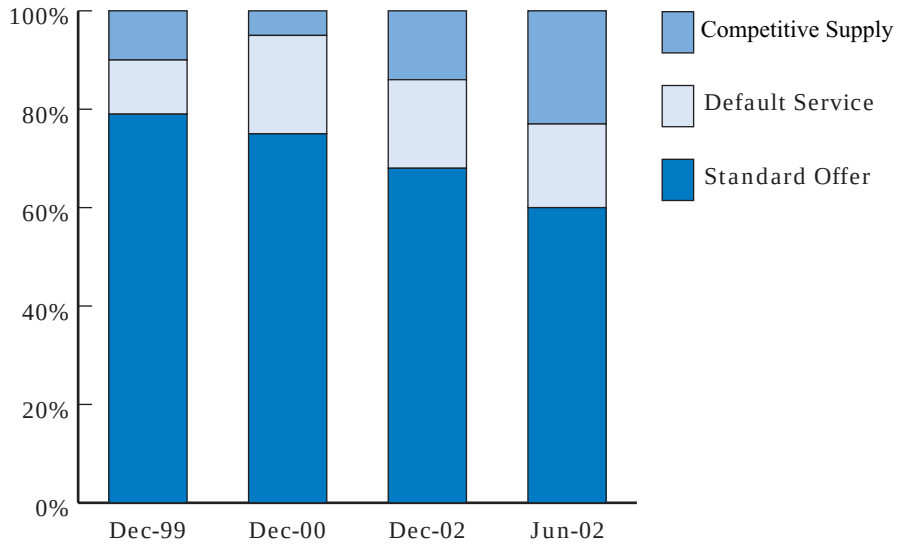
The low standard offer price in conjunction with the high costs associated with marketing to individual customers has made doing business in Massachusetts' retail markets difficult for competitive suppliers. As a result, of the more than 30 suppliers that have been licensed in Massachusetts since 1998, only a few have actively solicited customers and some have withdrawn from the market completely. The intent of the Legislature in passing the Restructuring Act was to allow seven years for retail markets to develop, but after more than four years, there has been little progress with smaller commercial and industrial (C&I) customers as well as residential customers. Thus, a fairly short period of time remains for the market to more fully develop before the seven-year transition period ends.

As stated previously, in 2000, the DTE allowed distribution companies to decouple standard offer and default service rates and base the default service price on market-based costs, which has made conditions significantly more attractive for licensed suppliers to do business in the state. That decision, combined with decreasing wholesale electricity prices nationwide in 2002 due to lower natural gas prices, has resulted in a recent surge in competitive supplier activity. Between November 2001 and June 2002, the number of customers buying power from competitive suppliers increased from fewer than 10,000 to almost 80,000 – representing almost a quarter of the state's total electric load, but only 3% of the state's customers – mostly large commercial and industrial customers.

Figure 10 shows that 60% of the state's electric load (70% of customers) remains on standard offer service, which expires in just a few years. At that time, these consumers

Sixty percent of the state's electric load and 70% of the Commonwealth's customers remain on standard offer service.

Figure 10: Electricity Purchased by Service Type in Massachusetts (% Load)



Source: Massachusetts Division of Energy Resources, Electric Customer Migration Data, August 2002

will move – absent a fully developed retail market – to default service, which will likely be based on market prices.

The Massachusetts DTE opened an investigation into Competitive Market Initiatives (D.T.E. 01-54) to investigate ways to enhance competitive supplier marketing efforts to customers. An investigation into the Provision (Pricing and Procurement) of Default Service (D.T.E. 02-40) was also opened.

Issues to be considered to foster the development of a robust competitive retail market for all customers include:

- Should a distinction be made between business (both C&I) and residential consumers in making evolutionary changes to the framework of the retail market?
- If standard offer service expires in the absence of a robust competitive market for residential consumers, these customers will become default service customers. Under what terms and conditions will default service be provided?
- Should additional steps/incentives be established to speed up the development of a retail market?

Infrastructure Improvements to Enhance Transmission

New England's electric transmission system has not kept pace with gains in supply, which has caused costly operational issues. System-wide transmission congestion has cost consumers hundreds of millions of dollars since competitive wholesale markets began operating in 1999. The most significant congestion problem lies in southwestern Connecticut, but an area of congestion lies within Massachusetts as well – specifically in the metropolitan Boston region.

Transmission assessments conducted by ISO New England indicate that transmission congestion between 2002 and 2007 could cost Massachusetts consumers millions of dollars a year. Today, all transmission "congestion" costs are shared equally throughout New England. However, beginning in 2003, customers in "congested" areas may bear the total burden of congestion costs as a result of regional bidding being implemented by ISO New England under ISO's standard market design rules.

Another significant transmission issue is "bottled generation" – generation that cannot be moved out of a particular area because of limitations on the surrounding transmission system during peak demand periods. This has been caused, in part, by new power plants being sited in close proximity to natural gas pipelines, and not necessarily due to the availability of transmission capacity.

These inter- and intra-regional constraints not only limit supply and increase costs to consumers, but also stifle competition, in that only a few generating companies have access to some areas. These constraints have arisen, in large part, because the correct economic incentives to trigger investment in transmission and distribution system improvements have not been in place.

Finally, transmission lines are difficult to site in that they cut across many local jurisdictions and do not have a confined footprint like a power plant. Permitting can be a lengthy process that is difficult to achieve. It should also be noted that there are some

The region's transmission system has not kept pace with gains in supply.

In the Boston area, depending on location, congestion costs may increase prices in 2003.

Transmission is regulated by FERC, but siting falls under state purview.

transmission infrastructure projects on the drawing board that are regional in nature and will require approvals from more than one state.

Proposed federal (FERC) rulemaking on standard market design – for Regional Transmission Organizations – currently under review is designed in part to influence greater transmission investment in the future. However, in the meantime, there are some considerations:

- Should incentives be established to promote improvements in transmission infrastructure?
- Can the environmental siting and approval process for transmission infrastructure be streamlined in a fair manner at the state level?

Declining Fuel Diversity

New England's electric generation supply resources currently consist of a diverse and reasonably balanced combination of coal, natural gas, oil-fired dual-fueled (oil/gas), hydro and nuclear plants along with generation from renewable sources, and power purchases from outside regions as shown in **Figure 11**.

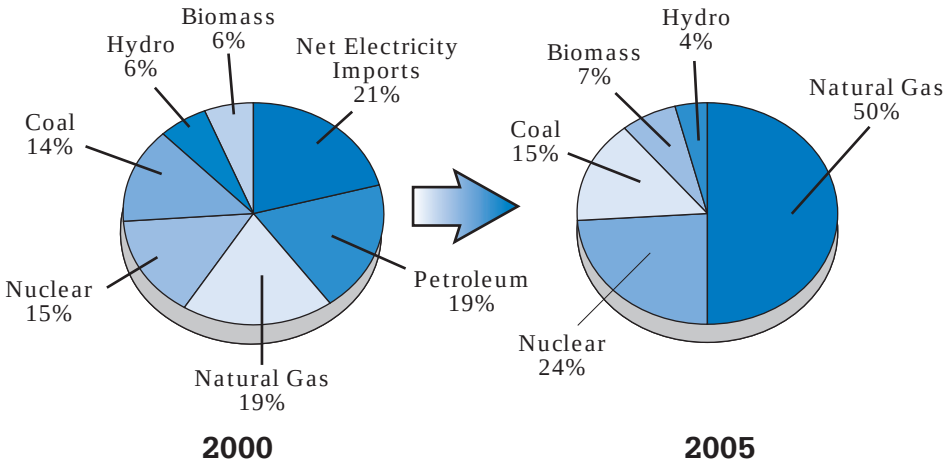
New England's reliance on natural gas to fuel all new plants, however, has raised concerns that new plants may cause existing natural gas pipeline capacity to be approached or exceeded within a few years. In addition, up to 75% of the new power plants being built or currently in operation are located on just two of the region's five major pipelines. As a result, the security of the gas grid is becoming increasingly important to the reliability of the electric grid.

Natural gas is now the fuel of choice for new electricity plants.

There is concern that increasing reliance on one fuel source could impact reliability.

Under the bidding process established to set electricity prices in the wholesale market, natural gas power plants already set the price about 75% of the time in New England. Natural gas prices as shown in **Figure 12** have historically been volatile, and there is no reason to believe that this characteristic will significantly diminish – which means that the region will become more susceptible to price swings in the

Figure 11: New England Electric Generation Fuel Mix

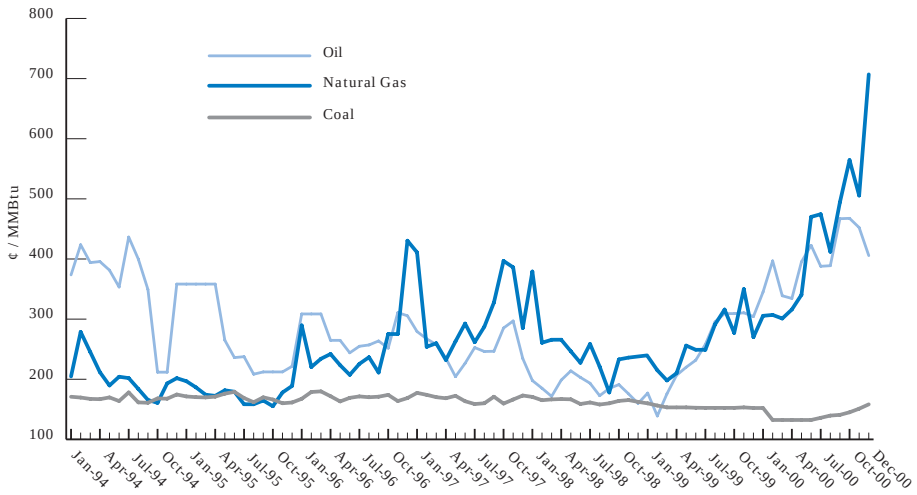


Source: ISO-New England

wholesale electricity market. In short, New England electricity prices will track natural gas prices. Diversity of supply cannot completely insulate consumers from price swings in fuel costs, but it can help reduce their magnitude.

Diversity of supply is also being threatened by increasing environmental regulation of the state's coal and oil-fired power plants. At the end of 2000, the Massachusetts Department of Environmental Protection (DEP) promulgated new air emission regulations for NOx, SO_2, CO_2 and mercury emissions, which have been touted as the toughest in the nation (310 CMR 7.29, Emission Standards for Power Plants). While it is important to support environmental quality, it is also important to assess the impact of regulations on fuel diversity, system reliability and cost to consumers. First-in-the-nation, ground-breaking regulations can have significant economic impacts. The implementation of such regulations must minimize the cost of compliance to the extent possible, particularly in today's current challenging economic climate with both the Commonwealth's and corporate budgets under severe strain.

Figure 12: Fossil Fuel Price Volatility (1994–2000)



New England's electricity prices will track natural gas prices which have historically been very volatile.

Unfortunately, there is the mistaken belief that the cost of new regulatory requirements on coal and oil-fired power plants will not be passed on to consumers. That is false for two reasons. First, coal units set the wholesale price of electricity for several hours each day. Second, if coal units were to close, it has been estimated that it would cost Massachusetts consumers about $200 million in increased electricity costs.

To help increase fuel diversity, the Restructuring Act created a Renewable Energy Trust to be administered by the Massachusetts Technology Collaborative to promote the development of renewable energy in the Commonwealth. Beginning March 1, 1998, a ratepayer charge (about 0.075 cents per kilowatt-hour) was established to fund renewable projects. Between 1998 and 2003, a total of about $150 million will be collected from ratepayers to stimulate new supply and demand for renewable energy and help establish the infrastructure needed to support a growing, sustainable and

competitive market for renewable energy. In subsequent years, the Trust will receive about $22 million per year.

To date, funding for viable renewable electricity projects has been limited (solar, wind, etc.), as efforts have primarily focused on technology analysis and strategic planning initiatives. More recently, grants have been awarded to schools and other public buildings to incorporate renewable technologies. While these projects are important, they will not significantly increase the diversity of electricity fuel supply.

The Renewable Energy Trust Fund was established to increase electricity fuel diversity by funding renewable projects as a source of economic growth. However, progress has been limited.

The Massachusetts Restructuring Act also directed DOER to establish a renewable portfolio standard for all retail electricity suppliers selling electricity to consumers in Massachusetts. Beginning in 2003, each supplier must obtain at least one percent of its supply from qualified new renewable generation units. In order for these standards to be meaningful, however, viable renewable generation units must be in operation by that time, which now appears unlikely.

There are several issues in the area of fuel diversity that must be considered. Coordination with other New England states is warranted given the region's interconnected power grid:

- Should efforts be made to promote the construction of power plants that are not fueled by natural gas?
- Is the cost impact to consumers of the new environmental regulations governing coal power plants being appropriately considered?
- Should the content and implementation of new power plant air emission regulations (310 CMR 7.29) be reviewed for consistency with legislative intent?
- Are the funds accruing in the Renewable Energy Trust being applied in the most beneficial manner possible? If not, should more prescriptive project funding guidelines be developed?
- What adjustments are necessary to the renewable energy portfolio standards and when should such adjustments be made?

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