

Senator Paul Tsongas

The Massachusetts Plan *Through Survival to Stability*

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THE MASSACHUSETTS PLAN: THROUGH SURVIVAL TO STABILITY

I. INTRODUCTION

The single dominant phenomenon during the next 20 years will be energy. Its price—and more critically, its supply—will set in motion self-sustaining, market dynamics that will reward the foresighted and crush the complacent.

As a nation, we are unprepared.

As a state, we are unprepared.

As communities, we are unprepared.

As individuals, almost all of us are unprepared.

II. THE PLAN

The plan asks: What resources don't we have? What resources do we have? What kind of economic base can we compete for and how do we maximize that capacity to compete?

A. What resources don't we have? The fact is that we don't have fossil fuels within our borders. This means the following:

1. Every dollar spent on oil, gas, and coal, for heating, transport, and commercial use is a dollar exported from our state. The greater the use of these fossil fuels, the greater will be the drain of our capital.

2. Every economic activity dependent upon the supply of these fossil fuels is in a critical, precarious condition. Any wise decision-maker in a fossil fuel-based, energy intensive industry will, if possible, locate, relocate, or expand where the supply is.

3. Every personal activity (i.e., driving to work, heating one's home) is subject to wildly escalating prices and interruptions, thus hindering those activities. Businesses dependent on a human resource base that engages in these activities will, if possible, gravitate to where the disruption is minimized.

B. What energy resources do we have? The fact is that we have remarkably diverse alter-

This plan seeks to confront the future and prepare for it. Its simple premise is that our state can survive the inevitable body blows of the future only if we so choose. And by choosing, we can craft a position of relative invulnerability that will serve as our major economic foundation.

The energy situation is, indeed, the equivalent of war. It threatens Massachusetts more gravely than many less energy-dependent states. We are already suffering economic injury without any plan for self protection.

War it is, and it's about time we began the mobilization.

native energy resources (resource recovery, low-head hydro, wood, solar, wind). We have enormous conservation potential that can drastically cut our per capita fossil fuel consumption.

This means the following:

1. Every dollar spent on indigenous energy sources (i.e., weatherizing one's home) is a dollar multiplying through the system, reinforcing our economy, not draining it.

2. Every economic activity based on an indigenous energy resource (e.g., the RESCO energy supply to General Electric in Lynn) is for all intents and purposes secure from supply and price disruptions—and thus vitally stable. (See Section III.A.5 and Section IV.B.1.)

3. Every human activity based on an indigenous energy resource (e.g., living in passive solar heated homes, bicycling or walking to work) is also secure, and thus makes more attractive to the decision-maker the location in Massachusetts of human resource based industries. (See Section III.6.)

C. What industries can we compete for and how do we increase our capacity to compete? We can compete for energy intensive industries to the extent that we can link those industries to indigenous energy supply. We

can compete for energy non-intensive industries (such as those involved with high technology, health, education, service industries, traditional industries with specialized skills) if we provide the milieu that such industries favor: adequate supply of skilled personnel, assured access by workers and management to the workplace, reasonable independence from energy supply shocks for workers and management.

The Massachusetts Plan is a blueprint for action in each of these areas. It outlines proposed federal, state, local, corporate, and individual decisions which, taken as a whole, will protect Massachusetts from imminent

III. ENERGY: THE PRIORITY OF RENEWABLE RESOURCES AND CONSERVATION

Massachusetts must seriously embrace renewable resources and energy conservation. This basic priority will allow us to maximize a dependable energy resource base, and stem the current \$6 billion-per-year capital outflow from Massachusetts for energy resources. The report of the Harvard Business School's Energy Project and many other comprehensive scientific analyses are in agreement that conservation and renewables are our energy future.

They are an absolutely urgent priority because the oil market will deteriorate rapidly in the 1980's. Four nations openly hostile to U.S. interests—Iraq, Iran, Libya, and Algeria—produce one-third of OPEC's oil. Many of the more moderate OPEC nations are reaching production peaks. Domestic oil and gas production peaked several years ago despite increased drilling activity. Even with decontrol, domestic production is expected to decline steadily during the 1980's.

Price eruption and supply disruption in energy are inevitable. They will bring sweeping societal change because how and where we live and work have been influenced greatly by the availability of cheap energy and the assumption that it would continue. A fundamental transformation now is taking place, which we must realize, analyze, and direct.

Massachusetts citizens face extreme, disruptive changes in their lives due to the energy crisis:

Exorbitant energy prices and the resultant economic shocks will make home ownership difficult and will cause abandonments of marginal housing to skyrocket.

The cost of commuting will force some workers into unemployment and create labor shortages for firms located far from their employees.

Gasoline prices and shortages will devastate

danger and potential disaster. It is a framework to hold onto the human and corporate resources that we have, and to secure from other states newcomers who will recognize the reinforced stability and strength of Massachusetts.

I believe there is an urgent need for serious public debate on Massachusetts' response to the energy crisis of the next two decades. This plan is my effort to open that debate. It is provocative and will, no doubt, prove controversial. But, it is offered with the hope and expectation that suggestions and criticism will improve it. It is an invitation to every Massachusetts citizen to join the debate.

tourism and retail industries dependent on automobiles. (See Section IV.B.2.)

The Massachusetts economy will be drained by the cost of importing energy. Businesses and their highly skilled workers will head for the Sunbelt.

While the tax base shrinks, the need for social services will grow.

The need for fuel supplies will result in waivers of environmental standards. The burning of coal and high sulfur oil without pollution control equipment will result in significant health costs and will greatly reduce environmental quality, especially in cities. (See Section III.B.)

There is no rationale behind our state of unpreparedness. Massachusetts produces only 3 percent of our energy needs, which causes billions of dollars to drain from the state's economy annually. Massachusetts is 80 percent dependent on oil, of which 80 percent is foreign, and yet 80 percent of our homes are underweathered.

Even if energy planning were adequate nationally—and it is not—it likely would be far short of what the facts demand for Massachusetts. Quite simply, our energy position will be the single most important factor influencing our lives during the next 20 years. Without careful planning and hard choices, our lives will be shaped and Massachusetts misshapen by drastic energy disruptions. Prodded by our extreme energy circumstances, we must begin to lead the nation into the energy future.

A. Conservation and renewable resources

The state's only indigenous energy resources are conservation, solar, hydro, wind, wood, and other renewable resources. Their widespread acceptance depends on millions of individual consumer and business decisions. Private citizens, corporations, community groups and government must all work together to make Massachusetts first in the

nation in energy conservation and renewable resource development.

During the past several years, I have supported the outstanding efforts of the New England Energy Congress to develop an action energy plan for our region. Many of their recommendations are reflected here in the broad context of Massachusetts' economic future.

1. Federal role:

The federal government must provide programmatic leadership, financial assistance, and regulatory guidelines. Washington must provide financial incentives to individuals and businesses to invest in conservation and renewable resources; funding for state and local governments to develop and implement energy planning and programs; research, development, demonstration, and commercialization activities for new technologies, and regulations to ensure efficiency standards for buildings, vehicles, and appliances. In particular, the federal government must:

a. Enact and fully fund the Conservation and Solar Bank. This legislation, which I authored, would provide interest subsidies on loans used to finance conservation and solar measures in residential and commercial buildings.

b. Enact and fully fund the Community Energy Act. This bill, which I authored, would provide energy block grants to local governments for planning, programs, and projects in energy conservation and renewable resource development.

c. Extend Daylight Savings Time in order to reduce the amount of energy used during the early evening peak.

d. Greatly expand the low-income weatherization program and make program modifications to improve effectiveness.

e. Establish a program to weatherize multi-family homes.

f. Provide aggressive programs for conservation and renewables in federal buildings. Results from the Norris Cotton Federal Building, an energy conservation demonstration project in Manchester, New Hampshire, should be reflected in construction of all new federal buildings.

g. Develop national building energy standards to require all new buildings to conform to strict conservation standards and incorporate passive solar design elements. (See Section V.B.I.)

h. Target all federal funding for housing, industrial, commercial, public and private development to conservation efforts. Include strict energy standards for all new buildings and require siting near mass transit or require development of mass transit capability. Use highway funding to promote efficient traffic patterns and develop bike paths.

i. Provide an aggressive marketing and commercialization program to expedite the development and widespread use of new conservation and renewable technologies.

j. Establish a program to encourage exports of solar technologies, including demonstrations, export financing, tax credits, information sharing, and international training programs. I plan to file such legislation this year.

k. Fund regional vocational training programs in conservation and solar technologies. (See Section IV.C.1.)

l. Greatly expand effort to raise public awareness and disseminate energy curricular material to public school systems.

m. Provide incentives to federal employees to use mass transit, bikes, vanpools, and carpools. (See Section V.B.2.)

n. Purchase fuel efficient vehicles for official use.

o. Expand eligibility for renewable and conservation tax credits.

p. Levy a 5% gas tax to fund increased federal investment in mass transit for both capital and operating assistance.

q. Extend automobile fuel efficiency standards beyond 1985, requiring 40 m.p.g. fleet average by 1995.

2. State role:

The Governor and State Energy Secretary Joseph Fitzpatrick have initiated several major conservation and renewable resource measures. If we enact the Governor's program and expand these efforts, Massachusetts can become a national model, demonstrating the full range of activity that a state without significant indigenous fossil resources can implement.

State government must:

a. Ensure that every residential and commercial building in Massachusetts receives an energy audit. The Governor and Energy Secretary Fitzpatrick have proposed a Residential Conservation Service program to provide audits that expands and improves upon the federally mandated program. State Senator Brennan has proposed legislation to require an energy audit before a home is sold. Both initiatives deserve strong support. We should also consider requiring weatherization or funds for weatherization in escrow at time of transfer.

b. Modify state utility regulation to encourage utilities to expand activities in conservation and the use of renewable resources.

c. Work with utilities, and local governments to exploit cogeneration opportunities and convert 100 percent of Massachusetts urban solid waste to energy. (See Section IV. B. 1. a-b.)

d. Streamline state licensing procedures to expedite new renewable resource projects.

The Massachusetts Energy Office's program for low-head hydro is regarded as a national model. This should be expanded to all decentralized renewable resources.

e. Adopt a strict building code that significantly reduces energy use and includes passive solar design elements. DOE has already recognized the state's Building Code Commission for its efforts and refers to it as a national model.

f. Encourage conservation and solar energy in public buildings throughout the state. Massachusetts' recently enacted Alternative Energy Property and Conservation Program will provide \$25 million in financial assistance to state, local, and public authorities.

g. Give authority to local governments to enact conservation ordinances and utilize zoning and subdivision regulations to conserve energy. The Governor is preparing legislation to do this.

h. Provide subsidies to encourage conservation and renewable resources. The Energy Development Caucus has proposed an Alternative Energy Development Corporation to provide subsidized financing to consumers and small businesses, and the Massachusetts Energy Office has proposed a program similar to the Conservation Bank to provide interest subsidies.

i. Establish a statewide energy extension service and consumer protection service to provide public information and to prevent consumer fraud.

j. Link automobile excise taxes to fuel efficiency and not age.

k. Enforce the 55 m.p.h. speed limit more strictly and increase fines for violations.

l. Levy a 5 percent gas tax to fund increased state investment in mass transit.

m. Provide exclusive rights of way on highways for van and car pooling and buses.

n. Structure tolls on highways and bridges to encourage van and car pooling.

o. Extend the Massachusetts Bay Transit Authority route system.

p. Make the MBTA a more efficient system by providing a stable funding mechanism and increasing the productivity through better labor and management practices.

q. Finance, expand, and integrate, inter-city bus transit through regional transportation authorities and private bus companies.

r. Maximize the use of the commuter rail.

3. Local role:

Local governments have many institutional tools to influence energy use. Because conservation and renewable resources involve decentralized activities, they are more effectively managed at the local level than the federal level. (The Community Energy Act, which I authored, would provide the

financial resources to communities for energy initiatives.) Comprehensive community energy planning will play the most critical role in our efforts to make Massachusetts more self sufficient.

Local communities must:

a. Start comprehensive energy planning to assess local energy problems and resources, and map strategies to reduce consumption and utilize renewables. The Franklin County Energy Conservation Task Force is one leader, with projects including recycling centers, fuelwood cooperatives, street lighting reductions, and comprehensive inventories of energy use and local supply potential. The Button Up Northampton program is another important community effort, with conservation education through the school system, a model energy audit program, and plans for bulk purchase of insulation for cost economies.

b. Initiate mobilization using community and neighborhood groups to provide public information, technical assistance, and weatherization assistance. Fitchburg's Operation FACE demonstrated how much can be done.

c. Weatherize single and multi-family housing through rehabilitation programs. Cambridge has proposed an innovative program to do this.

d. Adopt zoning and land use plans that protect sun rights and encourage efficient development patterns along transit corridors. (See Section V. B. 2 and D.)

e. Initiate public awareness programs and education programs in the schools. (See Section IV. C. 1 and VI. D. 3.)

f. Reduce municipal energy use through conservation and solar measures in public buildings and procurement practices that consider energy efficiency.

g. Actively develop low-head hydro, resource recovery, and district heating projects.

h. Encourage neighborhood co-ops to purchase insulation and conduct solar demonstrations.

i. Purchase fuel efficient vehicles for town employees (e.g., police, building inspectors).

j. Use school buses to expand mass transportation capacity for special activities.

k. Encourage bicycle usage by providing bike racks, bike lanes, and bike paths (e.g., the proposed Greenbush Railroad Right of Way Project, which would provide a 7½-mile bike route from Scituate to the Hingham commuter boat).

4. Utilities' role:

Utilities are in an ideal position to promote residential conservation and solar and to use decentralized options for renewable electric generation such as cogeneration, low-head hydro, and wind. A diversity of generation sources will increase reliability, and

decentralized options will require lower capital investments.

Massachusetts utilities must:

a. Offer no interest or low interest loans for residential conservation and solar investments. Pacific Gas and Electric in California, one of the largest private utilities, is offering no interest conservation loans to 1 million customers over the next 10 years. Pacific Power and Light in Portland, Oregon offers principal deferred loans for solar.

b. Establish creative programs of public information to promote efficient energy use and to discourage peak use. Hingham's municipal utility has cut its electric demand through such a program.

c. Offer peak load pricing and install time of day meters.

d. Encourage small power producers through favorable purchase rates and non-discriminatory back-up arrangements. Work with industry to install cogeneration equipment. Work with small producers to resolve interconnection and loan management issues. (E.g., New England Electric developed a creative financing arrangement for low head hydro in Lawrence.)

e. Initiate a load management program by installing load control devices on appliances and installing residential storage systems. New England Electric is initiating a major load management program.

f. Develop district heating or total energy systems where feasible (e.g., in new developments).

g. Actively demonstrate newer technologies such as fuel cells, utility scale wind machines, residential and commercial photovoltaics. Many utilities across the country have been gaining experience with these systems, which are expected to become competitive over the next 2 to 10 years. Southern California Edison is installing a 3Mwe wind machine and is planning hundreds more.

h. Actively initiate low-head hydro, wood fired generation, and municipal solid waste projects. Many utilities in our state have started to do this. Boston Edison is evaluating resource recovery; the Massachusetts Municipal Wholesale Electric Company is investigating 50Mwe worth of low-head hydro.

1. Utilities should work with local governments and developers to encourage energy efficient and renewable resource developments.

5. Corporate role:

Corporations can be a tool for promoting development of conservation and renewables. Corporations can individually utilize energy efficient processes and expand their use of renewables. They can also act as the catalyst for the energy efficient behavior of their employees.

Massachusetts corporations must:

a. Obtain comprehensive energy audit and take steps to reduce energy consumption and use renewable resources in company facilities.

b. Develop cogeneration, total energy systems, more efficient industrial equipment, and solar process heat. (See Section IV. B. 1.)

c. Provide employee incentives to take mass transit, carpool, vanpool, or bicycle (e.g., MBTA pass programs, flexible hours, preferential parking, elimination of free parking, vanpool financing, and shower facilities).

d. Purchase efficient automobiles for company fleets and institute a regular automobile maintenance program.

6. Individual role:

Energy cost and supply interactions most drastically affect the lives of individuals. We have had sufficient warning. In making decisions in our personal lives, we must seek to protect ourselves and our families from the impact of the coming energy crisis.

There are many steps we can each take. Some examples are:

a. Purchase fuel efficient automobiles, and use your automobiles more efficiently.

b. Obtain an energy audit and install weatherization measures.

c. When buying or renting a home, consider energy factors such as availability of mass transit, energy efficiency of the structure, and suitability for solar retrofit.

d. Schedule energy consuming activities (i.e., showers, laundry) during off-peak hours.

e. Live as close to workplace as possible.

f. Turn down the water heater and the thermostat, and purchase only energy efficient appliances.

g. Use public transportation whenever possible. (See Section V. B. 2 and C. 2.)

B. Other options

In the long term, renewable resources and fusion could provide most of energy supply, but projections indicate that in 2000, fusion will not yet be commercial and renewables will provide only between $\frac{1}{4}$ and $\frac{1}{3}$ of our energy demand. Depending on the effectiveness of our efforts at reducing electric demand, load management, industrial cogeneration, and tapping our indigenous resources, we may need to build additional power plants.

We should not build new oil-fired power plants and, when possible, we should reduce our reliance on base-load oil-fired capacity. By the mid to late 1980's, we will be able to evaluate electric demand growth, assess the results of our efforts in renewables and conservation, and determine how large a gap exists in the mid-term. For all practical purposes, after we maximize efforts to bring on-

line decentralized renewable resources, the choice is between coal and nuclear. Given what we know about the short and long term environmental impacts of coal, that option should be avoided. While we must develop more effective environmental controls and new coal combustion and conversion technologies, the carbon dioxide problem (greenhouse effect) which threatens massive climate changes should preclude any large scale shift to coal.

If the nuclear option is to remain viable, we must redouble our efforts to make nuclear plants safer, reestablish the credibility of the Nuclear Regulatory Commission, and restore public confidence. The NRC must be reorganized to strengthen the focus on protecting public health and safety. The lessons of Three Mile Island must be incorporated in all existing and new plants. The technical capabilities of utilities must be expanded. Evacuation plans must be put in place. A technical and political solution to waste disposal must be vigorously pursued. The NRC and the nuclear industry must adopt rather than resist fundamental changes in organization, procedures, and attitudes.

To be realistic, these efforts will take several years. But given our state's dependence on oil for electric generation, we must be prepared in the late 1980's to accept additional nuclear plants—if we have resolved

the problems with nuclear and have maximized our efforts in conservation and renewable resources. These are absolutely essential prerequisites. Utilities should not be allowed to build new nuclear capacity unless and until they have demonstrated true leadership in the conservation and renewable resource area as TVA has done. Incurring the costs and risks of nuclear power while allowing relatively benign alternatives to remain unused is not in Massachusetts' vital interest.

The present generation of light water reactors should be seen as an interim option only. Long term reliance on plutonium cycle breeder reactors with their nuclear proliferation risks must be avoided. Research and development efforts in fusion offer some optimism with respect to bringing this new energy source on-line early in the next century. Fusion, coupled with conservation and renewables, should provide electric generation for future generations.

During the next 20 years we must take steps to diversify Massachusetts' energy base to minimize supply interruptions. In the short run we must mount an all-out effort to reduce electric demand, manage electric loads better, and tap indigenous, renewable, decentralized sources. In the midterm we may have to add some coal and nuclear capacity but only under stringent environmental, health and safety standards.

IV. ENERGY EFFICIENCY AND INDUSTRIAL DEVELOPMENT

A. Introduction

Energy efficiency must be the prime determinant in our Commonwealth's industrial development strategy. The energy facts for business and industry are no different than for individuals. Massachusetts does not have significant supplies of fossil fuels within its borders. Every year Massachusetts suffers a multi-billion dollar capital outflow for imported fuels. Dependence on imported fuels also guarantees constantly escalating prices and the continuous threat of supply interruptions. Although industry can and will pass along fuel price hikes to consumers, the threat of supply interruptions is devastating to any business enterprise.

For the Massachusetts economy to survive the energy crisis and to remain stable and vibrant, industrial energy needs must be met. In particular, energy intensive industries must be closely linked to indigenous energy supplies, and a concerted effort must be made to ensure that our Commonwealth remains a highly competitive environment for industries with low energy use and high labor intensity.

B. Energy intensive industries

1. Retain existing energy intensive industries by ensuring operational efficiency and maximizing use of indigenous resources that can provide reliable fuel supplies at relatively stable prices.

a. Resource recovery: expand the use of waste for energy.

(1) Make maximum use of energy from waste recovery.

(E.g., the United States converts 1% of urban waste for energy; Switzerland converts 40% and Denmark converts 60%.)

(2) Expand current efforts in Massachusetts to tie in waste recovery facilities with energy intensive industries (e.g., in Saugus, the RESCO facility's tie-in with General Electric in Lynn; the Braintree Resource Recovery Plant tie-in with Weymouth Art Leather Co.; Norton Company and Monsanto plans for similar ventures in Worcester and Lynn).

(3) Increase federal assistance for resource recovery through tax subsidies, price supports, and loan guarantees.

(4) Develop state and local government capacity for planning and site selection of resource recovery facilities.

b. Cogeneration: exploit energy wasted in industrial process steam. Require users of process steam to cogenerate electricity for their own use and for sale to the grid, and remove institutional and regulatory barriers to this activity.

(1) Estimated energy potential from cogeneration in New England States is an additional 1000 Mwe—the equivalent of a new nuclear plant.

(2) Cogeneration requires a cooperative effort of industry, utilities, state, and federal governments.

c. Solar energy and energy efficiency: aggressively pursue all sources, including:

(1) Heat recovery/reuse of waste streams (e.g., the thermal recovery system in the Bolt Beranek and Newman Inc. building in Cambridge, which cost approximately \$100,000, created unexpected space savings, and is saving \$70,000-\$75,000 per year in energy and maintenance costs).

(2) Use of smaller electric motors and lights.

(3) Insulation.

(4) Computer controlled temperature and lighting (e.g., the Malden Housing Authority's energy monitoring computer for several hundred subsidized housing units).

(5) Solar energy process heat.

2. Develop comprehensive planning to protect the tourist industry, the number two industry in Massachusetts. The tourist industry is 80 percent dependent on automobile travel, and is therefore especially vulnerable to periods of energy instability and fuel shortage, when tourist related travel is considered non-essential. Federal, state, and local governments must work to increase public transportation access to tourist facilities and to reduce tourist travel by automobile.

a. Federal, state, and local policies:

(1) Financial assistance to promote integration of transportation and lodging facilities with tourist areas.

(2) Financial assistance to expand and improve public and private mass transportation access to tourist areas.

(3) Development of bicycle paths into and within tourist areas (e.g., the 65-mile Boston to Cape Cod Trail).

(4) Expansion of water transportation facilities to tourist areas.

(5) Expansion of Masspool program for tourist ridesharing and expansion of bus service program to tourist areas for low and moderate income families.

b. Private sector policies (hotels, airlines, museums, art galleries, recreation facilities, bus companies, commercial businesses, and restaurants):

(1) Development of package trips and tours based on public and private mass transportation.

(2) Increased development of brochures, maps, guidebooks, and informational materials which provide information on mass transportation access to tourist areas.

(3) Support for federal, state, and local financial assistance to expand and improve public and private mass transportation access to tourist areas.

C. Energy nonintensive industries

Even after Massachusetts maximizes its self-sufficiency in energy by coordinating energy intensive industrial development with indigenous energy resources, our state will continue to suffer in competition with oil-rich states for energy intensive industries. Economic development efforts should be aimed at low energy consumption industries. We must increasingly look to industrial sectors where human resources, a Massachusetts strength, are the key input. Service industries such as education, health, and insurance must remain strong elements in our economy.

We must recognize that, to a great degree, our future rests on our ability to attract and accommodate high technology firms. The high technology industry, a relatively low energy consumptive industry, is now and must continue to be the showcase industry in the Massachusetts economy. High technology companies are non-polluting exporters of high value-added products and importers of income. They sell in a world market, which contributes positively to the domestic economy of the U.S. trade balance, and they attract skilled workers. Massachusetts must educate more productive workers for the high technology industries, which currently face a manpower shortage. We must provide these industries with energy efficient transportation facilities and improved export capability. (High technology industries export 34 percent of their production.) We must reform tax policies to permit the necessary investment in these firms to take place. Finally, we must begin to expand our use of Massachusetts based fish and agricultural products:

1. Development of skills availability.

a. We must ensure that school curricula, at all levels of education, train students in marketable skills.

b. The state should encourage high technology firms to establish engineering scholarships for public and private educational institutions such as the University of Massachusetts, the University of Lowell, Massachusetts Institute of Technology, and Northeastern University. The state should increase funding for engineering programs at public

institutions and continue to develop and fund community college programs for technical training. (Governor King and Secretary Kariotis should receive full support for their efforts to focus manpower resources on technical training.)

c. The federal school loan program must be improved. The maximum loan limits must be made more realistic. We must reward future engineers with more generous than average loans.

d. Congress must pass the Research Revitalization Act, S. 2355, which I introduced in March as an antidote to economic stagnation and declining productivity. It would award a tax credit to any firm that contributes money to a university for research—thus creating a cost-effective mechanism to encourage research with practical applications in business and industry. It would provide universities with funds to pay students assisting in such research endeavors.

2. Improvement of Massachusetts transportation:

a. Railroads:

(1) Congress is in the process of deregulating the railroad industry in an effort to allow the rate flexibility necessary to provide capital for reinvestment. Railroads constitute an important and valuable infrastructure which we must maintain.

(2) The Northeast Corridor Improvement Project must be completed as soon as possible with federal assistance. This should decrease transit time and make rail more competitive.

(3) Where appropriate, the state or federal government should buy railroad rights-of-way if the private company is incapable of maintaining them.

b. Massport must continue active promotion of Boston as a major transport facility—a gateway to the United States for foreign shippers and to Europe and other foreign markets for American business and industry. Massport must continue to:

(1) Improve cargo facilities to strengthen our economic base (e.g., increase air freight capacity by building the Bird Island Flat facilities at Logan).

(2) Pursue state and federal funding to further develop the Port (e.g., expand the Castle Island facility, fill 38 acres of the finger piers for containerport facilities, and develop the South Boston Naval Annex property).

(3) Promote intermodal linkage between rail and air or ship transport.

c. The Massachusetts Aeronautics Commission must promote the development of air transportation for Massachusetts products (i.e., additional development of Worcester airport for air freight for Massachusetts high technology firms).

d. The trucking industry must pressure vehicle manufacturers to produce the most efficient vehicles possible, and must promote

fuel efficient transit practices within the industry (e.g., reduce trips with empty vehicles).

3. Expansion of export capability:

a. The Export Administration Act, passed by Congress in 1979, attempts to give the Commerce Department input into the Defense Department's awarding of high technology export licenses. It cannot be allowed to fail.

b. Federal assistance must be provided to make U.S. exporters competitive:

(1) The Export-Import Bank must be put on equal footing with the export banks of our competitors.

(2) Taxation of U.S. companies' efforts abroad must be commensurate with our competitors' approaches.

4. Financial Incentives for Industrial Development.

a. Congress must enact a tax cut for industry. Tax reform, aimed at promoting reinvestment, is essential.

b. Congress must approve legislation for Incentive Stock Options (S. 2239). These would provide an incentive to workers to increase their productivity, and a source of capital to their company.

c. Support for Governor King's "social contract" with industry is essential. Particularly, the state must target capital gains tax relief and provide additional funding for the Massachusetts Technology Development Corporation. (This Corporation provides equity capital to fledgling firms with high promise.)

5. New Emphasis on Agriculture and the Fishing Industry:

Agriculture and fishing are two traditional industries that could play an important role in our efforts toward energy independence. Massachusetts, 92% dependent at present on imported food supplies, must face the fact that rising costs of transportation (mostly by trucks) will dramatically increase the cost of food. Thus, an aggressive policy to develop these indigenous Massachusetts resources should be pursued. This will also help to preserve the rural character of small communities, protect them from random development, and enhance the quality of the rural Massachusetts landscape.

a. Fishing and farming policies on the federal level must be structured to assist the small farmer and the independent fisherman. (E.g., FmHA financial and technical assistance programs should have set-asides for the small farmer.)

b. National Marine Fisheries must be funded adequately to support the development of the fishing industry.

c. State tax policy must be restructured to encourage farmland preservation.

d. The \$10 million Development Rights Program must be continued and expanded.

e. Local zoning must be structured for the protection of farmlands.

V. ENERGY EFFICIENCY AND URBAN
REVITALIZATION

A. Introduction

Suburban sprawl was made possible by inexpensive, abundant energy resources, and encouraged by federal housing and highway policies. Escalating adverse changes in energy supply and price are highlighting the basic energy inefficiencies of suburban sprawl: low-density, energy inefficient residential housing, and automobile dependency for commuting and shopping. The soaring price of new construction in particular will encourage adaption of existing structures to housing and commercial needs.

Economic reality mandates that new residential and commercial/industrial development be concentrated in cities. The economic opportunities will be in older, denser neighborhoods and in city centers. Government programs and policies must now be focused on encouraging the urban revitalization, and on maximizing the inherent energy efficiency of cities. Public funds must leverage private investment into urban areas.

B. Federal programs and policies

1. Develop federal programs and policies to encourage energy efficient development.

a. Enact the Community Energy Act to provide funding to state and local governments for energy conservation and renewable resource activities.

b. Require Executive Agencies to undertake, where appropriate, an energy impact analysis program, including development of a State and Regional A-95 Clearinghouse review process to include evaluation and comments on the energy impact of grant proposals.

c. Adopt strict conservation, land use, and transportation policy requirements as a condition of federal funding to state and local governments.

d. Direct existing housing, community and economic development program funds to promote urban energy conservation and urban revitalization.

(1) Mandate energy efficiency standards and passive solar on all federally assisted housing.

(2) Provide incentive funding for energy efficient housing and weatherization.

(3) Reauthorize and fully fund the Home Mortgage Disclosure Act and continue Community Reinvestment Act activities aimed at increasing financial institution investments in urban communities.

(4) Reauthorize and fully fund Community Development Block Grant, Urban Development Action Grant and assisted housing programs, and provide set-aside and bonus funding to promote energy conservation.

(5) Provide assistance and incentives for financial institutions to provide mortgage and investment credit for downtown and neighborhood development.

(6) Authorize the National Public Works and Economic Development Act, to provide funding for infrastructure improvements and assistance to businesses expanding or locating in distressed areas.

(7) Enact legislation to permit continued tax exemption of mortgage revenue bonds, with an emphasis on mortgage revenue bond programs which support community and economic development activities in downtowns and neighborhoods.

(8) Fully fund and support historic preservation programs, with increased emphasis on the use of historic preservation funds through revolving loan pools (e.g., the Architectural Conservation Trust for Massachusetts) and adaptive re-use projects involving energy efficient features.

2. Develop transportation strategies to reduce dependence on the automobile.

a. Develop policies and incentive funding to promote and maximize mass transit use.

b. Provide full funding for Urban Mass Transportation Administration and develop a Mass Transit trust fund.

c. Condition federally assisted housing and industrial development funding on accessibility of projects to mass transit.

C. State programs and policies

1. Develop state programs and administer federal assistance to states to promote energy efficient development.

a. Build capacity to undertake comprehensive energy conservation and renewable resource activities funded through the Community Energy Act.

b. Develop energy efficiency evaluations as part of A-95 State and Regional Planning Agency proposal review process.

c. Provide continued support for state programs which finance business and industrial expansion and development and which finance single and multi-family housing (e.g., Massachusetts Industrial Finance Agency, Massachusetts Housing Finance Agency, and long-term energy residential conservation strategy developed by Governor King and Secretary Matthews).

d. Provide bonus funding and give funding priority to state funded and federally funded activities administered by Massachusetts which comply with state and local energy strategies.

e. Provide recreation areas in central cities. (See Section VI.E.)

2. Develop transportation strategies to reduce single-passenger use of the automobile and overall dependence on the automobile.

a. Reduce or eliminate tolls for car and van pools (e.g., the Massachusetts Turnpike Authority's new fare structure).

b. Provide special lanes for car and van pools.

c. Develop links between mass transit and car and van pools.

d. Reduce insurance for car and van pools and mass transit use.

e. Encourage private industrial/commercial development of state-owned land and air rights adjacent to transit facilities (e.g., Star Market/Massachusetts Turnpike Project in Newton, and Southwest Corridor neighborhood development project in Boston.)

f. Use school buses in non-school hours for special public transportation services, including services for the elderly and the handicapped.

g. Expand water commuting facilities and services (e.g., commuter boat from South Shore to downtown Boston).

h. Give funding priority to road projects which provide access for in-town industrial/commercial development projects (e.g., Crosstown Industrial Park in Boston).

i. Develop publicly owned and feasible privately owned sites for commuter parking.

j. Provide bike racks and bike access on commuter rail, intercity buses and at transit terminals.

D. Local government programs and policies

1. Create or amend programs and policies to encourage energy efficient development.

a. Build capacity for energy conservation and renewable resources planning and activities (Community Energy Act).

b. Use local powers (water, sewer, zoning, building permits) to reduce industrial and commercial development that is dependent on automobile use, and to promote development in town and city centers.

c. Direct federal, state and local funds to activities which are consistent with the local energy plan.

d. Direct capital expenditures to support energy efficient development (e.g., street lights, roadways and other capital improvements to mass transit accessible commercial areas).

e. Implement energy efficient building and zoning codes.

f. Develop a local housing policy which incorporates the following key elements to maximize energy efficient living patterns:

(1) Rehabilitate existing housing stock and make energy conservation improvements (e.g., conversion to elderly housing of the Bugle Buick dealership in Taunton, the Cuticura Soap Factory in Malden, Tabor Mills in New Bedford, and the Academy Building in Fall River).

(2) Adaptively re-use vacant or underutilized commercial and industrial space for housing and mixed used development.

(3) Minimize demolition of existing housing.

(4) Mandate passive solar and energy efficiency standards for all newly constructed housing.

(5) Encourage high density, energy efficient construction models for newly constructed housing, including row housing.

(6) Mandate access to mass transit for all new housing, and use local powers to reduce residential development which is dependent on automobile use.

(7) Remove legal and administrative barriers to residential renewable resource use (e.g., remove zoning code prohibitions against solar collectors on single family housing).

g. Establish partnerships with the private sector to:

(1) Encourage the retention and expansion of existing industry and commerce and develop community investment strategies through formal mechanisms such as "business cabinets" and local development corporations (e.g., JOBS for Fall River, Inc., an umbrella agency created to coordinate local economic development agencies, including the local development corporation, the industrial commission, the industrial development financing authority, the redevelopment authority, and the economic development department).

(2) Maximize use of private resources for development, including technical assistance from educational institutions, revenue bond and mortgage loan pool financing through financial institutions, private financing of publicly assisted projects and technical assistance to local community groups (e.g., Springfield Central, Worcester Cooperative Council, Pride, Inc. of Fitchburg, local development corporations and Small Business Administration 502 programs).

2. Develop transit strategies to reduce dependence on the automobile.

a. Use federal highway funds for development of car free areas of the city (e.g., Downtown Crossing in Boston) and for development of more efficient traffic patterns.

b. Encourage Regional Transportation Agencies to provide linkages between local bus routes and commuter rail.

c. Develop publicly owned and feasible privately owned sites for commuter parking.

E. Private sector programs and policies

1. Work in partnership with the public sector, particularly local governments, to promote energy efficient development and development patterns. Establish partnerships with the public sector to:

a. Encourage the retention and expansion of existing industry and commerce and develop community investment strategies through formal mechanisms such as "business cabinets" and local development corporations.

b. Maximize use of private resources for development, including technical assistance from educational institutions, revenue bond and mortgage loan pool financing through financial institutions, private financing of publicly assisted projects and technical assistance to local community groups (e.g., Springfield Central, Worcester Cooperative Council, Pride, Inc. of Fitchburg, local de-

velopment corporations and Small Business Administration 502 programs).

2. Develop business policies that reduce employee and customer dependence on automobiles:

a. Make use of flexible work hours.

b. Establish car and van pool programs (e.g., Digital's '74-van program).

c. Provide shower facilities and bicycle racks to promote bicycle commuting.

d. Encourage the use of public transportation for customers through Board of Trade and Merchant Association promotional campaigns.

VI. QUALITY OF LIFE

Stabilization of the Massachusetts economy is contingent upon successful competition for energy non-intensive industries and energy intensive industries that use our indigenous energy supplies. In order to attract such industries, we must also provide an environment that is irresistible to workers and businesses alike. Massachusetts cannot compete with Texas and her energy supply, but the quality of life in Massachusetts will help overcome this disadvantage. We must enhance and better communicate this quality.

A. Historic preservation

Massachusetts is best known for her historic sites, which serve as a magnet for attracting both Massachusetts residents and tourists. The rich history of Massachusetts should be optimized as an economic resource in the following ways:

1. Greater state and local utilization of historic sites as a central focus of the tourist industry.

2. Upkeep and preservation of historic sites with combined local, state, federal, and private funding (e.g., the Roman Candleworks building in New Bedford and the Howe Building in Lowell).

3. Location of small traditional industries in proximity to historic sites (e.g., the crafts industries and Old Sturbridge Village).

B. Arts and culture

As we rely on the quality of life to attract and retain industries and workers, we must begin to reevaluate people's perceptions of art and culture, and the roles that art and culture play in everyday living.

In order to stay ahead of other states, Massachusetts must cultivate an arts and culture movement from the grass roots up. Community arts should become the rule rather than the exception, and can happen in the following ways:

1. Statewide promotion of the arts and of the Commonwealth's rich cultural heritage.

2. Promotion of the arts through local business networks.

3. Art displays in public buildings of the work of local artists.

4. Implementation of the Commonwealth's Arts Lottery, recently signed into law by Governor King.

5. Utilization of local arts councils to coordinate low-cost community-based activities such as:

a. Arts festivals focusing on indigenous art forms and cultures.

b. County fairs, exhibits, street fairs, tours and art displays in local firms and educational institutions.

c. Agricultural, industrial, technological or lifestyle-themed events associated with regular community activities.

6. Special recognition by Chambers of Commerce and local arts councils of the efforts of businesses and community-based organizations in promoting the arts.

C. Ethnic diversity

As the first port of entry for many immigrants to this country, Massachusetts has benefitted from wide ethnic diversity. Each ethnic group brought along a wealth of tradition and culture; each contributes to the quality of life in Massachusetts. In recognizing the contribution of each ethnic group, we will begin to live out the covenant for peace that will ensure genuine celebration of ethnic diversity without divisive competition among individual ethnic groups.

We must strive to protect the rich multi-ethnic heritage of Massachusetts by:

1. Community-based heritage celebrations and ethnic arts festivals.

2. Multi-ethnic history presentations in schools, churches, temples, service clubs, etc.

3. Public library story-time series (directed at children) on the history and traditions of various ethnic groups.

4. Holiday celebrations in the tradition of various ethnic groups.

5. Funding ethnic museums and mobile heritage displays.

D. Education

Massachusetts developed the first public education system in the country and remains a leader in academic excellence in higher education. In order to ensure high quality in public elementary and secondary education, and to prepare our children for an increasingly interdependent world, we must insist on:

1. A "back to basics" strategy regarding proficiency in reading, writing, and arithmetic.

2. A second language requirement at the elementary school level in the context of programs to provide global awareness.

3. Courses on energy utilization and conservation beginning at least at the junior high school level.

4. Urban gardenry courses to increase food self-sufficiency.

5. Vocational education programs tailored toward training in energy conservation and renewable resource applications.

E. Recreation

The 1978 Statewide Comprehensive Outdoor Recreation Plan (SCORP) lays the foundation for utilization of our natural resources to enhance the quality of life in Massachusetts. As stated in the Plan, "open space and outdoor recreation are essential to the health and vitality of both individuals and communities." The need to provide outdoor recreation in an increasingly urban state is obvious. Open space and conservation programs to help control unplanned regional growth are essential. There are very direct roles that local, state, and federal governments must play to plan for outdoor recreation and open space services. In addition, the role of private organizations in helping to coordinate recreation activities is fundamental to a statewide plan for land usage.

1. Federal role:

The basic role of the federal government in recreation activities is to provide maintenance and funding assistance through:

a. The Fish and Wildlife Service and the National Park Service (responsible, for example, for the Boston and Minuteman National Parks, the Cape Cod National Seashore, and the Parker River and Great Meadows National Wildlife Refuges).

b. The Heritage Conservation and Recreation Service provides recreation planning and financial assistance for land acquisition, development and rehabilitation through the Land and Water Conservation Fund, and urban park rehabilitation funding through the Urban Park and Recreation Recovery Act.

c. The Army Corps of Engineers (responsible for flood control, and river and harbor maintenance services which support recreational boating and sport fishing activities).

2. State role:

The Commonwealth is the largest landholder of open space acreage in Massachusetts, and thus plays a vital role in providing outdoor recreation opportunities. The state is responsible for:

a. Continuing to provide state funds to cities and towns for open space acquisition and development programs such as Urban Self-Help (e.g., High Rock in Malden) and Heritage State Parks (e.g., Fall River's Battleship Cove, Western Gateway's Hoosac Tunnel Museum in North Adams, Lynn's waterfront projects, and Gardner's crafts programs and tours tied to the old furniture mills—all of which combine open space, historic preservation, and business district revitalization).

b. Natural resource protection through such programs as Wetlands Restrictions and Scenic Rivers.

c. Providing an overall framework through the SCORP planning process for land use, policy determination, and market and research services.

d. Providing technical assistance to conservation and recreation organizations.

3. Local government role:

The role of local government is to:

a. Provide neighborhood and community outdoor recreation services.

b. Protect conservation areas through acquisition, zoning, subdivision ordinances, and other means.

4. Private sector role:

Private sector involvement in recreation services is crucial. The Trustees of Massachusetts and the Massachusetts Audubon Society, for instance, operate landscape, cultural and wildlife areas. In addition, private organizations are responsible for:

a. Construction and operation of such capital-intensive facilities as golf courses, ski areas, campgrounds, and tennis courts.

b. Implementation and support of regional plans for recreation and open space services.

F. The environment

At the same time that we provide wider outdoor recreational opportunities, we must ensure a healthy environment. One of the liabilities of industrial growth is environmental pollution. Just as we in Massachusetts have exhibited leadership in our use of our natural resources for technology, so must we take the lead in protecting the environment from the waste products of technological development.

1. Hazardous waste management:

a. Massachusetts must develop licensed

hazardous waste disposal facilities to ensure location of industry inside the Commonwealth.

b. Careful enforcement of the Resource Conservation and Recovery Act is essential to discourage illegal dumping of hazardous waste.

c. Appropriate resource recovery technology located near industry must be developed to obviate the need for landfilling and dumping. (Such technology is already in place in Europe, and in Texas and other states.)

d. The option of landfill sites must remain a last resort, and then only under carefully regulated and supervised conditions.

e. Congress must pass the Environmental Emergency Response Act (S. 1480) to pay for emergency containment of accidental releases of hazardous substances.

2. Rivers:

Major public investments in water quality improvements justify increased efforts to ensure public access to and use of cleaned rivers. We must maximize the use of rivers as complex resource systems.

a. Watershed greenways (management plans) must be developed statewide, using public and private funds, for river protection (e.g., Nashua, Housatonic and Charles Rivers with private dollars, and the North River projects with public dollars).

b. The Massachusetts Departments of Environmental Affairs, Economic Affairs, and Community Development must reach an interagency agreement to develop a model program for state river protection.

c. Regional demonstration programs must be developed to protect land and water

resources.

d. Clean-up projects must be promoted to enhance the use of our rivers for swimming, boating, and fishing (e.g., the Malden River beautification project).

3. Air quality:

a. No expansion of coal should be allowed at the expense of environmental standards. (See Section III.B.) We must speed development of second-generation coal technologies (such as fluidized bed combustion) which reduce sulfur and carbon dioxide emissions.

b. Massachusetts must establish vehicle emissions control systems as well as inspection and maintenance programs.

4. Recycling:

a. Encourage local recycling efforts of paper, metals, etc.

b. Pass and implement national bottle bill legislation requiring deposits on returnable beverage containers to eliminate litter and beautify our countryside.

G. Summary

The quality of life in Massachusetts will be the foundation for statewide economic stabilization. Land management, wildlife preservation, academic excellence, cultural diversity, and the historic legacy of leadership are dominant forces in Massachusetts. While energy technology, tax policy, and a skilled work force will provide financial incentives for business development in Massachusetts, the high quality of life will provide the grass roots incentive for community revitalization. With all of the ingredients in place, the energy future of Massachusetts will be secure.

VII. CONCLUSION

This plan, if implemented, should provide a protective barrier against the inevitable future energy shocks that hang over us. That barrier will secure those within our boundaries from all but the most severe disruptions.

This barrier is intended to be interlocking, with each piece valuable in and of itself, but also acting to reinforce all the others. It is a kind of geodesic dome—strengthened by the totality of its components, however small any single component may appear to be.

This barrier, this security, is meant to be more than just comforting and serviceable

to our people. It is meant as our chief marketable asset, the very foundation of our long-term economic viability in an increasingly competitive world.

The Massachusetts Plan is my effort to contribute a basis for discussion that will lead to decision-making. The plan obviously is imperfect. It will be modified where modifications are shown to be prudent.

But it remains a challenge to the six million decision-makers in our state: criticize, probe, amend, question.

But do not reject it without offering an alternative.

Paul Carter