ENERGY AND SMALL BUSINESS
IN NEW ENGLAND

by

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Introduction

Small businesses in New England are being badly hurt by the energy problem. They are being hurt directly — by price hikes and interruptions. They are being hurt indirectly by the deleterious effects the energy problem is having on the country as a whole. Estimates of lost GNP because of the 1973-74 price hikes alone run as high as $500 billion dollars. And they are being hurt because they are located in New England.

Energy poses special problems for New England as a region. It has a dearth of indigenous resources compared with other parts of the country. New England sits at the terminal end of the various supply chains, both foreign and domestic. It is more dependent on imported energy than other parts of the United States. For instance, in 1976, residual fuel oil provided 48 percent of total fuel consumption for New England manufacturing,

whereas natural gas provided 49 percent of fuel consumption for manufacturing in the rest of the United States. While virtually all of the natural gas is domestically produced, most of New England's residual fuel oil is imported. Indeed, 63 percent of the region's overall energy comes from imported oil — versus an 18 percent national average.

In addition, energy costs in New England are higher than in most of the rest of the nation. This applies even within the same energy source. In 1976, electricity was 69 percent more expensive in New England than elsewhere in the United States. In 1976, the average cost of energy, on a BTU basis, was 54 percent higher in New England than in the rest of the country.

The vulnerability for this region is underscored by lack of easy fuel switching and substitution in time of crisis, as indicated in the following table:

Table 1

Manufacturers Lack of Capability to Use Substitute Fuels
1977-78 Heating Season

<table>
<thead>
<tr>
<th></th>
<th>Electric energy (million kwh)</th>
<th>Distillate (1000 bbs)</th>
<th>Residual (1000 bbs)</th>
<th>Natural Gas (billion cu. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount</td>
<td>1693.8</td>
<td>185.9</td>
<td>3385.6</td>
<td>3.5</td>
</tr>
<tr>
<td>Percent</td>
<td>97</td>
<td>72</td>
<td>72</td>
<td>55</td>
</tr>
</tbody>
</table>

Source: Annual Survey of Manufacturers
America's overall energy situation is serious, much more serious than a skeptical, scapegoat-hunting public would believe. Long-term economic growth, as well as political stability and military security, are threatened by current patterns of energy supply and demand. Within that overall framework, New England's energy deficit places this region in an even more difficult predicament than other parts of the country.

- New England is particularly vulnerable to supply interruptions and such changes in the world oil market as price hikes and governmental changes by key producers.
- Rising energy costs mean a greater outflow of money from New England than in other parts of the country. Similarly, massive programs, such as those proposed for synthetic fuels, would also mean a transfer of wealth and employment from New England to other parts of the country.
- New England firms are at a relative disadvantage because of their higher costs for their energy inputs.
- Even without the regional disadvantage, higher energy prices and supply interruptions increase production costs, erode profit margins, restrain expansion, force contraction of business, and threaten unemployment. These effects may be felt directly, in a company's production runs. They may also be felt indirectly, as in the loss of business that restaurants, entertainment enterprises and resort areas have experienced because of the tight gasoline supplies earlier this year.
Relatively higher energy costs can encourage firms to relocate to other regions, with more stable supplies and more insulated prices. This means the export of jobs.

A major mitigating factor does stand out, however. Industry in New England is considerably less energy intensive than the rest of the country. In 1976, New England industry used 11.2 thousand BTUs for every dollar added, compared to 25.41 thousand BTUs in the rest of the United States. With the exception of paper, the heavy energy-using industries are not well represented in this region. Indeed, what is striking is the proportion of high technology firms, which tend to have low energy intensities. In 1976, these type of firms composed 48 percent of employment, and 51 percent of total value added.

In other words, firms in New England do bear an important disadvantage, though not quite as great as might at first appear. But the burden is real and should not be downplayed. In 1977, small businesses were surveyed across the country as to their energy costs. Table 2 shows New England's burden. The average costs in 1977 were 16 percent higher for small businesses in New England than nationwide. With the huge leaps in oil prices in the first half of 1979, one can safely surmise that the gap has
considerably widened in recent months, accentuating New England's disadvantage.42

Table 2

Survey of Average Monthly Energy Expenditures by Region for Small Businesses, February 1977

<table>
<thead>
<tr>
<th>Area</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>New England</td>
<td>1420</td>
</tr>
<tr>
<td>Mid Atlantic</td>
<td>1451</td>
</tr>
<tr>
<td>East North Central</td>
<td>1360</td>
</tr>
<tr>
<td>West North Central</td>
<td>1374</td>
</tr>
<tr>
<td>South Atlantic</td>
<td>1387</td>
</tr>
<tr>
<td>East South Central</td>
<td>1171</td>
</tr>
<tr>
<td>West South Central</td>
<td>1013</td>
</tr>
<tr>
<td>Mountain</td>
<td>924</td>
</tr>
<tr>
<td>Pacific</td>
<td>1010</td>
</tr>
<tr>
<td>U.S. average</td>
<td>1228</td>
</tr>
</tbody>
</table>


The Key Energy Source

What can be done? The answer is conservation -- energy efficiency. On many people's lists, conservation still appears as the fifth or sixth step in cutting costs. But the evidence has mounted since 1973 that conservation is the best, cheapest, and most abundant energy source available. The new Harvard Business School study, Energy Future, argues that in many sectors the United States could use 30 percent less energy without diminishing the level of "energy services" delivered. That is the equivalent of more than all U.S. oil imports. This certainly holds true for small business. A number of studies point out how, on an average, small firms can reduce their energy use by up to 30 percent with little or no investment -- just some attention to housekeeping.

Barriers to Conservation

Thus, there is no reason to think that the potential for conservation is any smaller among small businesses in New England (and throughout the country) than in other sectors of the economy. The value in realizing a substantial part of that potential is considerable, both for the individual firms and, in

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aggregate, for the nation. Yet the barriers also seem considerable.

* Many companies have little incentive to try to save energy -- or, at least, perceive little incentive.

To begin with, many firms do not see energy as a significant cost. Moreover, the potential energy savings are not seen as worth the effort in terms of enhanced profits or improved competitiveness. Owners of small businesses work, according to one survey, 56 to 60 hours a week, which leaves little time to learn about energy conservation. "Conservation would cost me more than it would save," an executive of a surgical products manufacturing firm told us. In this particular firm, heating power and water are all recorded together, and, altogether, are only 1.3 percent of sales. Moreover, this executive rationalizes non-attention on the grounds that the energy problem is not responsive to individual action: "The oil companies do whatever they want anyway."

Another manufacturer also reported that energy costs are "not a major factor of doing business." The prime manner in which this firm tries to cope with rising costs is to pass the costs along.

Similarly, a printing company has no idea of how its energy costs have changed as a percentage of profits, sales, or total operating costs. Energy costs are simply noted to have

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increased. Moreover, fuel, electricity, and gasoline are not broken down by source, process or function. They are all recorded together. Energy costs are, in the words of one executive, "Just another thing that you must pass on to customers if you're going to keep profit where you want it."

Survey data bears out the pass-along syndrome. In 1977, the National Federation of Small Businesses surveyed its members as to how they would respond to various hypothetical price hikes over two years. The bias in favor of pass-along was considerable.

<table>
<thead>
<tr>
<th>Response</th>
<th>10% increase</th>
<th>25% increase</th>
<th>50% increase</th>
<th>100% increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass on costs</td>
<td>71%</td>
<td>78%</td>
<td>77%</td>
<td>75%</td>
</tr>
<tr>
<td>&quot;Out of Pocket&quot;</td>
<td>25%</td>
<td>20%</td>
<td>19%</td>
<td>20%</td>
</tr>
<tr>
<td>Reduce Production</td>
<td>13%</td>
<td>20%</td>
<td>29%</td>
<td>31%</td>
</tr>
<tr>
<td>Conservation Investment</td>
<td>22%</td>
<td>29%</td>
<td>34%</td>
<td>36%</td>
</tr>
</tbody>
</table>

Note: Respondents could check more than one answer.

The same survey also indicates a bias against conservation among small businessmen, who perceive it as a threat or hindrance to their activities. Forty-four percent thought production should be given top priority in energy policy; 22 percent conversion; and 23 percent, conservation. Indeed, the negative attitude toward conservation was suggested by the president of the National Federation of Independent Businesses, when he described conservation as "a non-productive capital expenditure."

* Another problem that particularly inhibits a conservation response by small business is lack of capital. Large firms, in making investment decisions, are deciding among alternative uses for capital. Small firms frequently do not have the funds or cash flow to make a discretionary investment in conservation. If the funds are available, other uses are perceived as more pressing. In commercial building management, owners seem to expect a very rapid payback for any investments, which also limits conservation investing. Moreover, small firms see a greater uncertainty in such investments than do larger companies.

* Another major obstacle is lack of reliable information. A particularly illuminating example of inadequate information arose in the course of one of our interviews, conducted in early June. The president of a wholesale distribution company, with a fleet

of about 30 trucks, mentioned that no running account was kept of energy as a percentage of sales or profits. During the interview, he did some simple calculations that indicated that the $70,000 budgeted for gasoline and electricity in 1978 would increase by at least $15,000 in 1979 -- and that the $15,000 would come out of the service division's $40,000 of profit.49

* Other research indicates that conservation efforts among small businesses are impeded by the factors cited above -- small energy costs as a percentage of sales; inadequate information about energy costs; presumption that energy costs can be passed on; lack of capital.80

While energy costs are of varying intensities of concern, much more concern seems to exist about the effects of shortages and interruptions. That is understandable because such conditions can bring a company's operations to a halt, and small firms in particular cannot easily assimilate such shocks.

In early June, the head of the wholesale distribution company observed that shortages were more serious for his firm than increased costs. Past experience has made the company very fearful of the loss of efficiency and high costs of having

49Interview
service and sales people sit in gas lines. No doubt, recent experience has intensified that concern.

The printing company executive noted that interruption of oil supplies could force a shutdown. The estimated maximum period of operation without a delivery is one week.

Such reasonable fears lead to efforts to stockpile. The printing company is "toying" with the idea of constructing an extra 1000 gallon oil tank to provide an extra week of fuel in case of interruptions.\textsuperscript{1} Investigation in other parts of the country suggests that this kind of action helped tighten gas supplies in the first half of 1979.\textsuperscript{2} It is generally thought that the build-up in secondary inventories has continued to increase.

**Delivering Energy Conservation to Small Business**

How to improve the conservation delivery system to small business?

Information -- or the lack thereof -- is the starting point. "I read of many studies for energy conservation -- in many directions -- no coordination and no plan for a beginning," said one New England executive. "Industry needs facts, and I believe the lack of facts makes industry skittish about investment and future plans."\textsuperscript{3}

\textsuperscript{2}Los Angeles Times, May 22, 1979.
\textsuperscript{3}First National Bank of Boston Survey.
Small businesses need information so that they can better assess
-- energy costs
-- energy vulnerability
-- options

They need better access to know-how and assistance, and they need financial assistance.

Some changes are internally derived, in response to external stimuli. One area where the conservation "Message" has gotten across is in gasoline. Here, companies now seem to be looking for ways to economize and buffer themselves against shortages. The emphasis is on scheduling.

* The wholesale distribution company plans service trips in advance to economize in required driving time. The firm is now pleased to find that, by so doing, it is now reducing gasoline consumption.

* The printing firm has consolidated delivery trips in order to save gasoline, the only fuel source for which it has made a conservation effort.

* One company, with up to 40 different contracting jobs going on at one time, is considering mailing checks rather than delivering them (However, this contradicts union rules about delivery time of paychecks, and could lead to conflicts).**

**Interviews.
Some companies function as "conservation vendors," delivering the information and know-how.

For instance, a New England transistor manufacturer has initiated two major steps to save energy -- as a contribution to cost cutting. It is moving from one shift to two, since it is inefficient to turn its furnaces on and off. This way, it will be able to shut down permanently several furnaces. Second, it is reclaiming chemicals in processes. In this latter effort, it is aided by Allied Chemical, the supplier. Allied's regular sales representatives advise them on the possibilities for chemical recovery. In addition, Allied makes available engineers for practical help with analyses of their particular case and implementation needs.

Consultants of course can play a similar role. Xenergy, a Lexington, Mass., consulting organization, has developed a series of books for distribution through trade associations. The basic message is consistent throughout the publications. As the book directed toward retailers says: "Many retailers are not aware that they can save significant sums of money each year on energy -- a 20-30% net cost reduction is possible by applying the recommendations in this handbook. Unlike some other major costs such as labor and supplies, energy is a cost you can do something
about without risking loss of sales or employee and customer comfort.®

The Kernwood restaurant in Linfield, Mass., has reduced its energy consumption substantially through a number of measures:

1) reduced wattage of lighting fixtures from 150 to 75 watts.
2) installed an energy-saver package on the dishwasher, reducing its energy use by 80 percent.
3) installed automatic timers on light switches in storage areas (although there has been some employee resistance).
4) heat recovery -- rerouting water pipes to capture heat from cooking equipment, and so raising water temperatures from 50 degrees to 70 degrees.
5) switched to smaller truck for deliveries.
6) Added further insulation.

The owner of the restaurant was first alerted to energy problems two years ago by the Massachusetts Restaurant Association, which had printed a guideline for the restaurant industry with a check-list for energy-saving items. This guide directed the restaurant owner.**

The Association, with 1035 members, is now following up with one day seminars, based on a pilot project sponsored by the National Restaurant Association and the University of Wisconsin.

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**Cary Bullock to author, May 22, 1979; American Retail Federation, Energy: Cost Reduction in Retailing, p. 4.
**Interview.
The seminar concentrates on behavioral steps (rescheduling) and low cost initiatives. The seminar shows how energy costs can be reduced 15 percent just by better housekeeping, with little or no investment. (The pilot program found savings averaged between 15 and 35 percent, depending on previous levels of energy efficiency).

Energy costs are not the only imperative driving the program. Many restaurant owners and managers hope that if they can show 10 percent reductions in other areas, they will win exemption from temperature restrictions, which they fear will adversely affect their business. (As one restaurant owner observed, people who come to a restaurant are paying not only for the food, but also for the comfort).

Government as Vendor

The third and potentially most significant conservation vendor is government. But the relationship between big government and small business often is not a happy one — or at least not a useful one. Energy seems an example of such an unproductive relationship.

A sizeable number of federal energy programs are aimed at or involve small business. One recent compilation of federal programs includes the following.88

Project Payback (Energy Cost of Ownership Demonstration Programs — DOE)
Technology and Information Transfer Program (DOE)
Energy Analysis and Diagnostic Centers (DOE)
Energy Efficiency Sharing (DOE)
International Technology Sharing (DOE)
Publications/Audiovisual (DOE)
Trade Shows/Conferences (DOE)
Workshops/Seminars (DOE)
Energy Partnership for American Cities (DOE)
Small Business Energy Cost Reduction Programs (DOE)
Energy Extension Service (DOE)
Technical Information Program (DOE)
Technology Transfer Program (DOE)
Small Business Training Program (SBA)
Technology Assistance Program (SBA)

In addition, financing and R & D programs also involve small business as do a large number of state programs.
Yet many question the effectiveness of the wide-ranging program:

Programs which are designed to reach owners of small businesses face a special challenge. These persons are typically committing their full-time efforts to making their businesses work... owners of small businesses work an average of 50-60 hours a week. Thus, they have
little time to attend seminars and workshops or to read the latest energy conservation materials. Also, they are not always aware of the costs of their energy usage, so they see little need for taking time to alter those costs. Moreover, they are suspicious of government programs and are not initially inclined to become involved.**

The suspicion and initial distaste for government programs certainly has been increasing in an era of increasing numbers of forms and widening regulations, all of which makes for a burden disproportionately heavy for small business. On top of this problem, one must acknowledge that the overall signals on energy have been confusing to say the least. Fuel conservation and fuel conversion have both been encouraged, but they are often competitive activities. Moreover, even price signals have been confusing; between 1975 and 1978, the real price of industrial fuel oil declined 15 percent.***

While a multiplicity of programs is clearly desirable, to stimulate learning and diffusion, there is also a need for overall coordination. The National Energy Extension Service Act of 1977 took initial steps toward coordination by mandating an annual Comprehensive Program and Plan for Federal Energy

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**The Ohrand Corporation, Issues and Lessons Learned in Planning and Implementing Energy Extension Service Small Business Programs (1979), mimeo, p. 3
Education, Extension and Information Activities. But this is only a beginning. It would seem that the Energy Extension Service, working in cooperation with and through State energy offices, could provide the means. The EES is now on an experimental basis in 10 states. It should be put on a permanent basis and expanded to all 50 states. One of its main tasks should be outreach to small business.

A variation -- the regional "energy broker" -- has been suggested in the impressive report of the New England Energy Congress.

The large corporations are able to control energy costs by the hiring of energy managers or consultants to analyze their energy consumption. However, small businesses do not have the time to keep up to date on the most energy-efficient products, processes or the inclination to hire experts to solve an unperceived problem. Small businesses have adjusted to the higher cost of energy and have not yet addressed energy conservation as one of their best investment opportunities. Prior federally funded conservation programs were designed to create awareness of the energy problem with little attention given to implementation of conservation alternatives. Recognizing the environment

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in the small business community, the New England Energy Congress proposes the development of an aggressive regional organization to stimulate energy conservation in small business operations.

The energy broker, as the organization will be referred to, will provide decision-relevant information with a follow-up mechanism designed to maximize the utilization of recommended conservation alternatives. The energy broker's function will be continuous involvement in the decision-making process from responding to the initial actions taken.62

In either event, there are at least five key issue areas that a coordinating body can address.

1) Collection of reliable data on energy use patterns and problems in small business.
2) Delivery of information.
3) Audits - inspection and review of energy consumption with recommendations for alterations.
4) Assist in delivery of conservation know-how.
5) Financing and capital.

The last is a particularly significant consideration during a time of high interest rates. Small firms do not have the same discretionary capital that larger firms do. As a Massachusetts

executive expressed matters: "More difficult for 'smalls' who generally will be limited in financial resources and in-house technical know-how to accomplish conservation and substitute sources of energy." Currently firms can receive tax credits up to 15 percent for certain conservation investments. Elsewhere, I have elaborated on the rationale for much more significant tax credits, in the range of 40 to 50 percent. The current tax credits are too small to make a significant difference and to cross the threshold of the awareness barrier. After the tax credits were announced, only a third of small businesses replying to a survey said they would make use of the credits. In most cases, those in that third said they would apply the credit to equipment needed for programs previously planned. "Tax incentives work best for businesses that can plan further ahead than we can," explained a Rhode Island businessman. "We respond to market and cost needs, which usually overwhelm tax incentive, in our equipment planning and purchases."

Larger tax credits serve the nation's overall interest by stimulating investment in the United States, generating more GNP, reducing the outflow of dollars and jobs, and reducing the vulnerability of the U.S. to the international oil market.

However, given the shorter time horizons of small business, tax credits should not be used to the exclusion of other

Stobaugh and Yergin, Energy Future, Chapter 6.
mechanisms: loans, outright grants, and demonstration projects (France, with the most ambitious energy program, has an ingenious program that ties the sum of the government grant to the energy saved).\textsuperscript{66}

A co-ordinated, broad-ranging and non-intrusive government program can add up to be the most effective and useful of all conservation delivery systems.

**Small Business as Energy Suppliers?**

The other side of the energy coin for small business in New England is supply. This particularly applies to the high technology firms, which should have considerable opportunities for providing conservation and solar technologies. The federal government has traditionally under written risky R&D work, and is doing so today.

Ensuring that small firms play a much more active part in energy R&D is compelling from a national interest viewpoint. Various studies have found that small firms have provided half or more of all U. S. innovations and inventions from 1950 to 1973. Their flexibility, the advantage that a significant innovation brings and their entrepreneurial drives -- these are some of the factors that encourage their innovative bent.\textsuperscript{67}

\textsuperscript{66} Daniel Yergin, *France's War on Energy Waste*, working paper.

Thus, in general, strong reasons exist to ensure a major role for small firms in energy R&D. Two particular reasons focus attention on energy. First, the Department of Energy has become the second largest dispenser of federal R&D expenditures -- $5.3 billion in 1978.** Secondly, the "man-in-space syndrome" is wearing off. Despite a considerable bias toward high technology solutions (synthetic fuels, power towers), a growing consensus is developing among independent energy analysts that the major solutions to the energy problem will be many small innovations in conservation and solar renewables.*** These are target areas where small firms can play large and effective roles.

But small business has traditionally had difficulty in getting its share of federal R&D moneys. Between 1953 and 1973, only eight percent of all federal R&D awards went to small firms. Only two percent of DOE procurement goes to small businesses.****

Two observers have described the problem. Lewis Shattuck of the Small Business Association of New England has stated:

'The small businessman in dealing with the federal government finds that his greatest obstacle is to avoid getting lost between the cracks.' This statement came

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***See Stobaugh and Yergin, Energy Future, chapters 6 and 7.

from a small inventor currently trying to have his energy-related invention funded by ERDA [predecessor to DOE]. But the same observation could have been made by someone in the small business community trying to do business with the government beginning with World War II and continuing to the years when the country was gearing up for major space exploration. The small business executive has unique and extremely difficult problems in terms of gaining the confidence of the government toward his product or service in light of the fact that he is unknown and often with limited resources. That has always been the case and, to some degree, probably always will. Big government likes to deal with big budgets and with large businesses. It is easier, safer, less risky and just plain more comfortable. The individual finds it difficult to get the proper attention and guidance as to where to go because personnel are often working on bigger projects and programs.\(^7\)

Similar views were expressed by Milton Stewart, president of the National Small Business Association, who declared that the recent record of U.S. government energy agencies,

\(^7\)Lewis A. Shattuck, representing Small Business Association of New England, before ERDA, November 30, 1976.
With respect to small business is a regrettable too little, too late one, with which we are all too familiar. Once again, we have seen how hard it is for agencies with big ticket missions and big business constituencies to do justice to small business. They rarely maintain balanced priorities and balanced policies without the most explicit and stringently demanding legislation and vigilant oversight. 72

Small businesses do not often have what bigger firms have -- the time, the personnel, the network of contacts, and the resources -- to put it into pursuit of the federal R&D dollar. Yet, the country depends on small firms to help develop the incremental technologies that will amount to a "solution" to the energy problem. Therefore, a careful review of energy R&D is in urgent order, to ascertain how to overcome the barriers and disadvantages that affect smaller firms. A fast track to get energy R&D funds to small businesses will probably prove more useful to the nation's well being than a fast track for licensing big energy projects.

Conclusion and Policy Recommendations

Only sporadically since 1973 has the seriousness of the energy problem in the United States -- and in New England -- been recognized. But serious it is, and its many ramifications pose a challenge and a threat to the well being of small business, which is so important to the health and well-being of New England. Successful adaptation is not a foreordained conclusion. As Milton Stewart, President of the National Small Business Association expressed matters:

"For 40 years we have learned that every crisis this country has experienced has cost the small business sector of the American economy bitterly and dearly, beginning with World War II, Korea and Vietnam. I lived through all of these things and the attempt to adjust Federal policy to minimize its impact on small business. We failed every time. We came out of each of these situations with small business weaker, big business stronger and big government stronger than we went into it." 73

Two tasks must be attended to.

The first is to address the problems of small business as energy consumers. This means, in the short and medium term, addressing conservation -- promoting energy efficiency. There are three requirements -- consistent information effort, delivery of conservation services, capital and financing. Obviously this should take place within a larger political and economic environment that makes conservation attractive. Such an effort will help small business maneuver through the difficult energy shoals of the 1980's. At the same time, any BTUs saved serve the regional and national interest -- especially given how many of New England's BTUs derive from imported oil.

The second aspect is to harness more effectively the innovative talents of small business in New England to the problems of supplying conservation and solar energy. This means reducing the barriers to their participation in the large Federal R&D program.

As so often happens, the existence of a challenge and threat also constitutes an opportunity. That is certainly true in the case of energy and small business in New England.