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ENERGY CONSERVATION: EMERGING CONSENSUS, DIVERGING COMMITMENT

A STAFF STUDY

PREPARED FOR THE USE OF THE

SUBCOMMITTEE ON ENERGY

OF THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

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LETTER OF TRANSMITTAL

DECEMBER 30, 1980.

To the Members of the Joint Economic Committee:

I am pleased to transmit to the members of the Joint Economic Committee, other Members of Congress, and the general public a study by the staff of the Energy Subcommittee entitled "Energy Conservation: Emerging Consensus, Diverging Commitment."

Since 1975, the Energy Subcommittee of the Joint Economic Committee has studied the role of energy conservation in national energy policy. This staff study is another in a series of publications by the committee on this matter.

In 1973, conservation was virtually ignored as an energy option for the United States. Since that time, a new consensus has developed that energy conservation, as well as energy production, should be a major priority of national energy policy. Public recognition of the importance of energy conservation has led to a widely held perception that energy conservation has been emphasized to the detriment of energy production over the last 4 years.

This staff study examines whether that perception is correct. The staff study examines the level of Federal financial incentives for energy conservation and energy production. It concludes that the Federal financial incentives for energy production are seven times greater than those for energy conservation. If the Congress decides not to interfere in energy markets, price will be a neutral determinant in business decisions on energy investments. However, if the present imbalance of energy incentives continues and the Government continues to interfere in energy markets, the bias against energy conservation can have a harmful impact on our energy security.

The conclusions of this staff study represent the opinions of the chairman of the Energy Subcommittee and not necessarily all its members.

Sincerely,

EDWARD M. KENNEDY,
Chairman, Subcommittee on Energy.

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EXECUTIVE SUMMARY

There is a national consensus that energy conservation is an essential element of a balanced national energy policy, yet that consensus is not reflected in Federal financial incentives. Federal financial incentives for energy production continue to be seven times greater than energy conservation incentives.

In recent years, a consensus has developed that energy conservation--or energy efficiency--is an essential element of a balanced national energy program. The consensus involves every element of the energy policy community including academia, business, organized labor, and environmental and consumer groups. This consensus of support for energy conservation exists because conservation:

* is already succeeding in a major way--it has saved the equivalent of 6 million barrels per day of oil;

* is the most cost-effective, least inflationary alternative to insecure oil imports;

* has significant potential, especially over the next decade--it can save the equivalent of 16 million barrels per day by 1990;

* involves the least uncertainty about its energy benefits;

* is regionally and socially equitable; and

* has little or no political opposition.

In spite of the existence of this broad consensus in favor of energy conservation, conservation receives only one-seventh of the financial incentives that are available to energy production.

The study also observes that the most unpopular tool of Federal policy--regulation--is often used to promote energy conservation while the most popular tool of Federal policy--incentives or subsidies--is used to promote energy production.

The Congress faces a critical decision--whether the government should interfere in energy investments. If all energy subsidies were abolished, price would be a neutral determinant in decisionmaking between energy options. However, if the government continues to interfere in the market to increase energy security, it should redress the present serious imbalance in Federal financial incentives.

If large production incentives are continued, it will be necessary to establish a comprehensive energy conservation program to achieve a balanced energy policy. A comprehensive conservation program will have an ambitious goal, a large commitment of public funds preferentially treated in the budget process, a diverse set of positive incentives, and a priority position in the bureaucracy.

The study concludes that if conservation is to receive the priority it deserves, the public debate must move beyond a discussion of which conservation incentive is the perfect incentive. Designing ideal

incentives in our very diverse economy is not possible. Instead, the Federal Government must establish a diverse set of incentives which will enlist the ingenuity of businesses and citizens in a national effort to protect our energy security through increased energy efficiency.

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FEDERAL MONIES: ENERGY SUPPLY AND ENERGY CONSERVATION
BUDGET OUTLAYS AND OFF-BUDGET EXPENDITURES,
FISCAL YEARS 1973-81
(millions of dollars)

	1973	1974	1975	1976	1977	1978	1979	1980	1981
TOTAL SUPPLY	2875	2977	4612	4758	5730	6540	8045	9395	10735
TOTAL CONSERVATION	--	3	48	51	143	465	729	1265	1480

INTRODUCTION

Since 1973, the search for solutions to our energy problems has been caught in a web of highly controversial issues--issues of private versus public control, of prices and social equity, of health and environmental protection, and of national security. Meanwhile, little heed has been paid to the initial successes of an energy policy which is already working and has great promise largely because it involves little political controversy. That energy policy is energy conservation.

For purposes of this report, "energy conservation" is used interchangeably with "energy efficiency" and is intended to describe a policy of encouraging the rapid turnover or modification of inefficient energy-consuming machines for more efficient ones, or the accelerated adoption of management techniques that increase the productive use of available energy. It is specifically not intended to convey the widespread misunderstanding of conservation as a policy of cutting back energy use by reducing comfort, convenience, or, in the case of a business, customers. Although cutting back can in many cases be accomplished without sacrificing our standard of living, the enormous savings available through a comprehensive policy of energy conservation will ultimately be realized through investments in energy efficiency. Such investments accomplish conservation while maintaining or increasing our standard of living. The difference is important to understanding not only the potential for conservation, but also the potential for successfully implementing conservation policy.

CHAPTER I THE EMERGING CONSENSUS

The importance of arriving at a political consensus before an energy policy can succeed is obvious. Since 1973, Republicans and Democrats alike have been frustrated by the paralysis that seems to prevent our democracy from moving ahead on one of the most critical issues of our time. This paralysis has forced some commentators to propose fundamental changes in our form of government. The move to establish an Energy Mobilization Board has been in part motivated by frustration over a lack of public action to resolve the political stalemate. It would indeed be ironic if the United States succumbed to the temptation to establish anti-democratic institutions for solving energy problems while a politically acceptable, democratic, and popular cure for our paralysis remained unused.

Energy conservation is the one policy that has developed a broad consensus of political support in the United States. It was not always so. In the past some have attacked energy conservation as being anti-business, anti-market, and anti-growth. There are still many who either misunderstand or misinterpret energy conservation as a negative policy of cutbacks, inconvenience, and discomfort. Despite past misunderstandings, a new consensus has developed as study after study has concluded that conservation, understood as energy efficiency, is the soundest path and the soundest foundation for energy policy.

The National Academy of Sciences, in its report, Energy In Transition: 1985-2010, concluded, after five years of study, that

"conservation deserves the highest immediate priority in energy planning."1/

The AFL-CIO has called energy conservation "an indispensable ingredient in the resolution of the energy problem."2/

Consumer and environmental groups throughout the country have adopted energy efficiency as a fundamental national energy goal. The Union of Concerned Scientists, in its report, Energy: The Easy Path, found that "90 percent or more of the solution to our energy problems will come from improvements in energy productivity; 10 percent or less from supply expansion."3/

Finally, the Harvard Business School report, Energy Future, capped the development of this growing consensus with the statement that "conservation may well be the cheapest, safest, most productive energy alternative readily available in large amounts.... with virtually no penalty for the way Americans live--save that billions of dollars will be spared, save that the environment will be less strained, the air less polluted, the dollar under less pressure, save that the growing and alarming dependence on OPEC oil will be reduced, and Western society will be less likely to suffer internal and international tensions. These are benefits Americans should be only too happy to accept."4/

This consensus has developed in the business sector as well as in academic and public interest circles.

The National Association of Manufacturers concluded that conservation "is one of the most powerful means available to our Nation to reduce its excessive dependence on

imported oil ... improvements in energy conservation must be a fundamental part of any balanced national energy policy."5/ And even some oil companies, which have placed their strongest political efforts behind increasing energy production, have concluded that "energy conservation has been a major factor in restraining growth in oil imports."6/

Conservation Has Unique Advantages

Energy conservation has achieved this unique consensus because of its unique attributes. Energy conservation is the one energy policy that:

* is already succeeding in a major way;

* is the most cost-effective, least inflationary alternative to insecure oil imports;

* has significant potential, especially over the next decade;

* involves the least uncertainty about its energy benefits;

* is regionally and socially equitable; and

* has little or no political opposition.

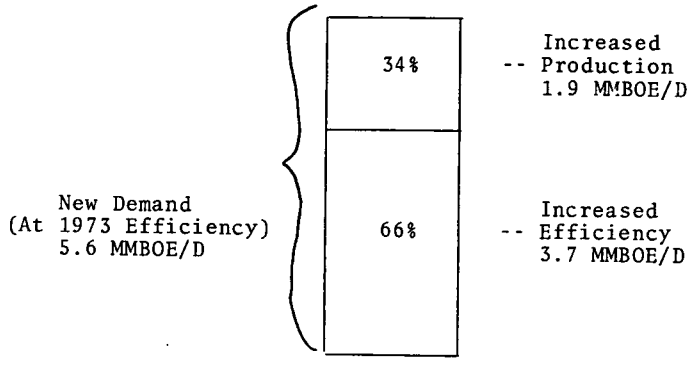
First, energy conservation is working. It has already proved to be a significant contributor to national energy supplies. Improvements in energy efficiency met over two-thirds of the growth in demand for energy services between 1973 and 1978. Figure I-1 illustrates conservation's contribution. In

a recent Energy Outlook, Exxon estimated domestic conservation savings in 1980 at the equivalent of about 6 million barrels of oil per day.7/

Figure I-1

MEETING ENERGY DEMAND IN 1979 VERSUS 1973:

EFFICIENCY AND PRODUCTION



Source: Monthly Energy Review, Department of Energy, November 1980, p. 14. Increased production is the difference between actual 1973 consumption and actual 1979 consumption. Increased efficiency is the difference between assumed 1979 consumption at the 1973 rate of energy consumption per GNP dollar and 1979 actual consumption. Quads have been converted to billion barrels of oil equivalent per day (1 Q = .47 MMBOE/D).

In spite of massive attempts to increase coal, oil, natural gas, and nuclear production, total U.S. energy production at the beginning of this year was only 2 percent more than it was in 1973. The paradox is striking--the one energy policy that has received the least taxpayer support--energy conservation--in fact, has been the most successful, while those policies that have received the most Federal support have been the least successful.

Even in those categories of domestic energy resources where production has risen--coal and nuclear power--the impacts upon imports has not been significant. This is because nuclear and coal today are used primarily for electricity generation and will continue to be used this way for several decades. Electricity generation only accounts for about a tenth of our total oil consumption and a fifth of our oil imports. Even a 20 percent increase in electricity generating capacity only produces a two to four percent oil import reduction. This decrease in imports has been almost completely offset by declines in domestic oil production in the past.

Second, conservation is the most cost-effective, least inflationary alternative to insecure oil imports.

Evidence of this fact is widespread and well-documented. The Energy Productivity Center of the Carnegie-Mellon Institute, for example, found in its study, The Least-Cost Energy Strategy, that a program of optimal energy efficiency could have reduced our energy production requirements by 22 percent from 1973 to 1978, while saving $37 billion in scarce capital for other productive uses. We would have spent only $948 per capita for

that energy in 1978, or almost $200 less than the $1146 per capita that was actually spent.8/

These savings would have accrued if homeowners, businesses, and industries had invested to the economic optimum. Instead of buying a gallon of heating oil for $1.00 per gallon, homeowners can save a gallon of oil for 5¢ by insulating an uninsulated attic,9/ or less than 40¢ per million Btu's. Synthetic gas will cost an estimated $9.20 per million Btu's, and synthetic oil an estimated $11.70 per million Btu's.10/ Similarly, industrial waste heat recuperators can save energy at a cost of less than half that of new supplies.11/

Third, conservation clearly has immense potential over the next decade. A diverse group of studies has reached this conclusion. Exxon estimates that conservation will result in a savings of 16 million barrels of oil equivalent per day by 1990.12/

The Harvard Business School report Energy Future concludes that conservation may well be the cheapest, safest, most productive energy alternative readily available in large amounts. "The U.S. can use 30 or 40 percent less energy than it does with virtually no penalty for the way Americans live over the next decade."13/

Roger Sant, Director of the Energy Productivity Center and former Assistant Administrator for Energy Conservation and Environment of FEA concludes in his paper, The Least-Cost Energy Strategy, that the full potential for improved energy efficiency is 13 million barrels per day by 1990, assuming 2.5 percent real growth and no new technological breakthroughs. This is 9

million barrels per day higher than what DOE expects to realize from current policy.14/

M.H. Ross and R.H. Williams, in their report Drilling for Oil and Gas in Our Buildings sponsored by the Center for Energy and Environmental Studies, Princeton University, concluded that energy efficiency could save the equivalent of 2.5 million barrels of oil per day by 1990 just from improvements in residential buildings.15/

The Office of Technology Assessment has estimated that in the residential sector alone, the potential for conservation savings is in the range of 2-4 million barrels of oil equivalent per day.16/

The Consumer Energy Council of America surveyed the range of estimates for conservation and production potential over the next decade made by ten national studies and concluded that:

> It is strikingly clear that conservation is an option of major national importance, especially in the short run. For the next decade, it is almost certain to be more important than the production options. The estimates for energy produced from conservation range from 19.6 quads to 31.2 quads in 1990, compared to estimates for production options which range from only 4.6 quads to 41.4 quads. One can safely say that energy conservation is indispensable to a smooth energy transition. (p. II-32)

In short, the potential is enormous--capable of eliminating the oil equivalent of our current imports from OPEC--and exceeding

the most optimistic estimates for synthetic oil substitutes over the next decade.

It is interesting to note that American Petroleum Institute has estimated that complete oil decontrol without a windfall profits tax would only increase U.S. domestic production by about 1.7 million barrels a day.17/ Conservation has already been more than twice as effective. And it has enormous future potential. It is estimated by Exxon Corporation that it will save 16 million barrels per day over the next decade.18/ The comparison of the success of conservation policy and the failure of an energy production policy since 1973 is striking.

Fourth, conservation is the one energy policy that is the most certain to work in the future. A recent report which reviewed a range of projected contributions to U.S. energy supplies found that there is significantly less variability in the estimates of conservation potential than there is in production potential. Conservation projections varied by only 60 percent while production options varied by as much as 700 percent.19/(See Table I-1)

Fifth, unlike energy production oriented strategies which have enormous regional inequities, conservation is regionally fair. A recent Senate Budget Committee analysis compared a synfuel-based energy strategy with a conservation-based strategy. The synfuel strategy produced enormous regional inequities with two Federal regions receiving almost all the benefits and pains. One Federal region received over 700 times more funds than another region.

TABLE I-1

INCREMENTAL ADDITIONS TO NATIONAL ENERGY RESOURCES
(In Quads)

	1990			2000			2010		
	Low Estimate	High Estimate	Disparity	Low Estimate	High Estimate	Disparity	Low Estimate	High Estimate	Disparity
CONSERVATION	19.6	31.2	59%	22.5	54.4	142%	46.9	73.0	56%
PRODUCTION	4.6	41.4	800%	40.6	115.6	185%	65.5	138.5	111%

SOURCE: Energy Conservation in New Buildings, A Report by the Consumer Energy Council of America, April 1980, p. II-35.

TABLE I-2

SUMMARY OF REGIONAL FUND FLOWS
(1980-1990 Investment)

Per Capita [1] (1979 dollars)	U.S. Avg.	Federal Regions									
		1	2	3	4	5	6	7	8	9	10
Supply Program	677	15	74	266	115	243	1,741	284	10,449	390	51
Conservation/ Substitution Program	1,183	1,844	1,844	1,503	1,008	672	1,372	1,226	1,409	686	715

SOURCE: Synthetic Fuels, Report of the Subcommittee on Synthetic Fuels of the Senate Budget Committee, September 27, 1979, p.44.

[1] 1985 population per census projection, Series II-8.

As Table I-2 makes clear, the range of regional investment based on a supply-based energy program is from $15 per capita in Region 1 to $10,449 per capita in Region 8--a difference of nearly 700 percent. In contrast, the range of regional investment based on a conservation/fuel substitution program is from $672 in Region 4 to $1,844 in Region 1--a difference of only 175 percent.

Finally, energy conservation is the one energy strategy which minimizes political opposition. Both the Democratic and Republican platforms for the 1980s extoll the virtues of energy efficiency and encourage its use. But there is the real danger that it will not receive the necessary support to achieve its full potential. Consistently it has been the energy option supported largely by exhortation and regulation, the two least effective forms of government activity. It has received the lowest level of economic subsidies, which are the most popular form of public activity.

CHAPTER II THE DIVERGING COMMITMENT

Unfortunately, the consensus of support for energy conservation has not produced a commitment of national resources to energy conservation. Despite the ever-broadening conservation consensus, U.S. energy policy appears to be frozen into a production strategy of minimal effectiveness. Within this strategy, energy efficiency is a flattered but underfed stepchild.

Federal expenditures are the soundest reflection of governmental commitment. Table II-1 compares Federal monies used to promote energy conservation with those

directed towards energy production. The production bias is substantial and persistent, both in actual budget outlays and in off-budget expenditures. With Federal energy expenditures rising steadily (from $2,875 million in 1973 to $10,735 million in 1980), the most certain, most immediate, and most cost-effective energy option continues to be denied a share of these growing resources which reflects its potential and its popularity. The replacement of a Republican Administration with a Democratic one has not altered this trend.

Energy conservation first appeared as a separate item in the Federal budget in 1974, with outlays totalling $3 million. Since that year, the figures rose steadily to $48 million in 1975, $51 million in 1976, and $143 million in 1977. Expenditures for energy production, however, increased by even larger amounts, from $2,875 billion in 1973 to $5,730 billion in 1977. Consequently, even with the near tripling of conservation monies between 1975 and 1977, expenditures for energy efficiency have only reached 12 percent of Federal energy expenditures.

TABLE II-1

FEDERAL MONIES: ENERGY SUPPLY AND ENERGY CONSERVATION BUDGET OUTLAYS AND OFF-BUDGET EXPENDITURES, FISCAL YEARS 1973-81
(Millions of Dollars)

ENERGY SUPPLY	1973	1974	1975	1976	1977	1978	1979	1980	1981
Budget Outlays	975	517	1742	2508	3265	3970	4900[1]	4600[3]	4700[3]
Tax Expenditures*	1900	2460	2870	2250	2465	2570	3145[4]	4795[2]	6035[2]
TOTAL SUPPLY	2875	2977	4612	4758	5730	6540	8045	9395	10735
ENERGY CONSERVATION									
Budget Outlays	--	3	48	51	143	221	252	600[3]	700[3]
Tax Expenditures*	--	--	--	--	--	244[5]	477[4/5]	665[4]	780[4]
TOTAL CONSERVATION	--	3	48	51	143	465	729	1265	1480
TOTAL ENERGY SPENDING	2875	2980	4660	4809	5873	7005	8774	10660	12215

* The Congressional Budget Act of 1974 (P.L. 93-344) requires a listing of tax expenditures in the budget. The Act defines tax expenditures as "revenue losses attributable to provisions of the Federal tax laws which allow a special exclusion, exemption, or deduction from gross income or which provide a special credit, a preferential rate of tax, or a deferral of tax liability." Tax expenditures are one means by which the Federal Government pursues public policy objectives and, in most cases, can be viewed as alternatives to budget outlays, credit assistance, or other policy instruments.

1/ Budget of the United States, Fiscal Year 1981, p. 603.
2/ "A Summary Outline of Federal Tax Incentives for the Production and the Conservation of Energy," Congressional Research Service, October 9, 1980, p. 5.
3/ Updated figures provided by the Office of Management and Budget, Unpublished, December 1980.
4/ Estimates provided by the Office of Tax Analysis, Department of Treasury, December 1980, Available from the Energy Subcommittee.
5/ $610 million in residential conservation tax credits were claimed in 1979. This included expenditures made from May 1977 through December 1978. We have arbitrarily allocated a proportional amount to each fiscal year ($244 million to 1978 and $366 million to 1979).

Largely due to residential conservation tax credits, Federal expenditures for energy efficiency passed the $1 billion mark for the first time in 1980. Monies for energy production, however, are projected to approach $10.7 billion, which is over 88 percent of total Federal energy expenditures in 1981.21/

Over the past six decades, the Federal Government provided enormous production subsidies, while virtually no conservation subsidies of any kind were granted. A recent DOE study has estimated that these energy-production subsidies total $217 billion.22/

The impact of these large subsidies can be illustrated by a recent study by the Federal Energy Information Administration which concluded that the cost of nuclear-generated electricity would be 75 percent to 100 percent higher if all past subsidies were paid by the rate payers.23/

In addition, not all of the actual Federal outlays directed towards energy production have been included in these estimates. The "energy conservation" and "energy supply" categories used in these charts were determined by the Department of Treasury for purposes of accounting for budget authorizations and outlays by function and subfunction. The "supply" category, however, excludes monies for regulatory activities which make possible the use of energy technologies. For example, listed in a separate subfunction category entitled "Energy Information Policy and Regulation," outlays for the Nuclear Regulatory Commission will reach $349 million in 1980. This figure alone is equal to nearly 58 percent of the total budget outlays for energy conservation in the same year.

Energy production subsidies, then, cost the Federal Government even more than is indicated merely by supply figures. Furthermore, an examination of the conservation subfunction category reveals that these relatively low figures are actually too high, because not all of the money is actually spent on conservation.

For instance, some of the expenditures classified as "conservation" are directed toward developing alternative energy production systems. In 1979, $12.5 million of the conservation outlays went to urban waste programs. Other "conservation outlays" promote energy efficiency only as a by-product. The weatherization program, for instance, is primarily a low-income assistance program. It commands a substantial portion of the conservation budget--$169 million in outlays in 1980. In FY 1981, $189 million has been requested.24/

The Energy Security Act, signed into law on June 30, 1980, clearly illustrates how entrenched are the disparities between conservation and production policy priorities. The Federal Government has pledged $17.5 billion in loans, price, and purchase guarantees over 5 years to promote synthetic fuels production. A second phase of $68.5 billion has also been authorized. The expected yield is 500,000 barrels of oil per day by 1987 and 2 million barrels of oil per day by 1992. The Federal commitment is comprehensive, despite the controversial nature of the program.

In almost a token gesture towards conservation, the establishment of a combination Solar and Conservation Bank was added as a "rider" to the Energy Security Act. A total of $2.5 billion was authorized

over 4 years--about 4 percent of the synfuels authorization.

The enormous imbalance in financial commitments in the Energy Security Act (ESA) is especially significant. The ESA was the most expensive energy incentive legislation ever adopted. It contains this enormous conservation/production imbalance even though it was passed after the conservation consensus had been achieved.

Another aspect of this unequal treatment not demonstrated by Table II-1 is the extent to which the government relies on mandatory regulation to accomplish conservation, but not production. Regulation can be an effective approach as has been demonstrated in the case of automobile mileage efficiency standards. However, delay in promulgation is inevitable and enforcement is problematic. More importantly, resistance from the regulated parties is frequently crippling, and the effectivenes of the standards is often compromised.

For example, appliance efficiency standards mandated in the National Energy Conservation Policy Act (NECPA), have not yet been promulgated. Similarly, promulgation and implementation of the Building Energy Performance Standards, mandated by the 1976 Energy Conservation and Production Act, were recently delayed for another 12 months to two years. There are serious doubts that the standards will ever be mandatory because of homebuilder opposition.

Too frequently the unpopular tool of public policy--regulation--is relied on to promote conservation, while the popular tool of public policy--subsidies--is used to promote energy production.

Summary

Despite the increasingly broad consensus developed over the last decade that a major national conservation program is essential, Federal executives and lawmakers have not yet assumed an aggressive role in leading the Nation towards greater energy efficiency. Very large disparities continue to exist between the levels of funding for conservation initiatives and the amounts of public monies channeled into various energy production strategies. And while energy production is generally encouraged through subsidization, energy conservation programs are largely regulatory in nature--a policy approach which has only limited conservation's effectiveness and undermined its political support. Today the noncontroversial promise of potentially enormous improvements in energy efficiency in every sector of the economy remains certain. What remains uncertain is whether policymakers will allow conservation to assume a role in national energy policy which is commensurate with its vast potential and proven contribution.

CHAPTER III WHERE ARE WE GOING?

The decisions that the Nation makes on balancing conservation and production incentives in the next few years will be critical in determining how the government affects the energy markets and how successful our energy programs will be in increasing our energy security.

The present situation of vastly disproportionate incentives is seriously

distorting energy economic decisionmaking. Rather than choosing the least costly option, investors are biased by Federal incentives to divert capital to production rather than conservation investments. The negative effect that such biases can have on energy decisionmaking can be illustrated by an example involving new home construction. A conventional house built in the northern tier states of the United States has a peak heating loss of about 20 kilowatts (68,000 Btu's per hour) but a new super insulated house has a peak heat loss of only 5 kilowatts (17,000 Btu's per hour). It would require a $20,000 capital investment in a coal or nuclear powered electric plant to meet the needs of the present type of new home. However, meeting the needs of an electrically heated super insulated home would only call for a capital investment of $5,000 in new electric generating facilities. Thus, although the low energy house costs an extra $2,000 to $4,000 to build, it will yield a capital savings to society of about $15,000. These capital savings can be invested throughout the economy where they can be used more efficiently.25/

The distortion of the present set of production/conservation incentives presents Congress and the Administration with a question it has often faced in the past: Should the government interfere in energy investments? If all energy incentives are abolished, there would be no problem in balancing conservation and production incentives. If markets work properly, price will be the neutral determinant in the decisionmaking between these options and presumably the least costly energy option will be chosen. However, a political consensus exists today that the government should play a role in the energy markets in

order to increase energy security. Many even argue that there should be a tax placed on imported oil of $10 per barrel or more because of the inherent cost to the economy of importing oil.

If the government continues to interfere in the energy markets by retaining the present imbalance of conservation and production incentives, a serious problem will persist. As illustrated in the example involving new homes, it can seriously distort investment and waste scarce capital in unproductive investments.

Thus, if we continue to interfere in the market to increase security, it is essential to repair the present serious disparity between conservation and production incentives to reduce economic distortion and to reach the goal of increasing energy security. The present level of production incentives are so large that a broad-ranging energy conservation program will be absolutely necessary to address this distortion.

An Example of "Comprehensive Energy Policy"

The character and size of an energy conservation program necessary to redress the present production/conservation incentive imbalance can be illustrated by examining the characteristics of the synthetic fuel program established last year by Congress.

This program had four key characteristics which illustrate how the Federal Government promotes an energy option in a comprehensive manner.

First, the synthetic fuel program has an ambitious goal. Goals are essential to focus national attention and invigorate bureaucratic energies. The goal of putting a man on the moon transformed the space program from a diffuse scientific endeavor to an effective mission-oriented program.

The General Accounting Office has commented on the seriousness of this problem. It states that:

> We continue to believe that the establishment of energy conservation goals and the development of a comprehensive plan is urgently needed for DOE to provide the leadership required to move the Nation toward using energy more efficiently. Although the Department has indicated its agreement with our previous recommendations, the United States still has no clear conservation goals or a comprehensive plan to meet those goals.
>
> In our view, the lack of such goals and a plan to meet those goals continues to convey the impression that the Federal Government is taking a leisurely approach to promoting conservation. On the other hand, the development of a comprehensive plan based on long-term goals would send a signal to the public, the ultimate energy conservation decisionmakers, that the Federal Government... is seriously committed to energy conservation.26/

It is therefore essential that Congress establish energy conservation goals just as

it establishes synfuel goals or other economic goals.

The common use of an index which can measure progress towards our conservation goals is also essential. For instance, one of our principal energy goals is reducing energy imports. This goal is measured regularly in energy reports issued by the Department of Energy on a weekly, monthly, and yearly basis. Measuring how we are doing is critical to maintaining public interest in, and governmental commitment to, an energy goal. No similar index has been widely used to measure our energy conservation progress regularly. If we do not measure how well or poorly we are doing, we will have no idea whether we are getting where we want to go. The energy/GNP ratio published quarterly by the Department of Energy may be an appropriate basis for a national index. Sectoral indices must also be developed. In both cases, their public publication should receive the same public attention that publication of the Consumer Price Index receives each month. Thus, it is essential that an accurate energy conservation or energy productivity index be widely accepted and promoted as a key indicator of energy efficiency progress.

The second characteristic of the synfuel program is that it has a very large commitment of public funds that are given preferential treatment in the budget process. Congress has appropriated a special $17.5 billion fund for the Synthetic Fuel Corporation's first phase. Congress has also stated its willingness to authorize an additional $66 billion for its second phase. Thus, although large specific projects have to be appropriated each year, $17.5 billion

has already been virtually guaranteed for synfuels development.

There are two key aspects of this special synfuel fund; first its large size and, second, it's special reservation for synfuels. In contrast, no large scale commitment to energy conservation funding has ever been made and no similar preferential budget treatment has been established. Thus, companies and citizens assessing incentives for energy conservation know that they are likely to remain small and that even the small incentives that have been promised may not be appropriated in the coming years as the budget becomes tighter and tighter.

The third characteristic of a comprehensive energy program illustrated by the synthetic fuel program is that it includes a diverse set of incentives. A potential synthetic fuel producer is offered a smorgasbord of incentives, including loan guarantees, purchase guarantees, grants, cooperative arrangements, leasing arrangements. This diverse set of incentives demonstrates Congress' overriding commitment to getting the job done. It did not attempt to tie the hands of the implementing agencies by choosing one or another "ideal" incentive that, in fact, may be a disincentive to many companies. In contrast, most of the conservation debate has concentrated on what kind of incentive to use. Are grants better than loans, better than tax credits, better than leasing arrangements? If we had the same level of commitment to energy conservation as we have to synthetic fuels, all of the incentives would be offered and potential conservers would choose the incentive which best suited their varying financial situations.

In addition to being diverse, synthetic fuel incentives are all positive incentives. During the early stages of the debate on synthetic fuels, it was proposed that the development of synthetic fuels be mandated by requiring that a percentage of each refinery's oil supply be synthetic fuels by 1990. This would force the private sector to pay for all the costs. This regulatory approach was quickly rejected. The proponents of synthetic fuels realized that such a regulatory program would soon be mired down by opposition just as the building energy performance standards face and the electric appliance efficiency standards are now in the Department of Energy. Thus, it is essential that a broad-ranging conservation program include a whole host of positive financial incentives so that a potential conserver will have a choice among various options to increase energy efficiency.

Fourth, the synfuels effort has been given a priority position in the bureaucracy. Early in the legislative process, synthetic fuel proponents decided to create the Energy Security Corporation outside the Department of Energy. Their reasoning was simple. If the synthetic fuels program were just one among 30 or 40 programs at DOE, it would not receive the level of bureaucratic and professional support considered necessary to make such a program work.

A similar priority for energy conservation must be established if we expect to meet ambitious conservation goals.

A Recent Energy Efficiency Initiative

A comprehensive energy conservation program of the kind that is necessary to meet an ambitious national goal was proposed as an amendment to the Energy Security Act last year by Senators Kennedy, Durkin, and 9 other cosponsors. The Energy Productivity Act (Amendment 1308 to S. 388) established the national goal of reducing our oil imports by 4 million barrels of oil equivalent per day by 1990. The program included entirely positive incentives. Different incentives to meet different needs were included.

First, it provided for direct grants to individual homeowners or apartment dwellers who insulate and take other measures to increase the efficiency of home energy use. The maximum grant in the program was $750. Rather than entangling the energy conservation program with income restrictions, the proposal made the $750 grant taxable. Thus, the progressivity of the tax code was used to make the distribution of the funds equitable. The program was modelled after a Canadian grant program which began three years ago in Nova Scotia and is now being used nationwide. The Act proposed funding residential conservation at a level of $25 billion for 7 years--roughly the same level as the Canadian program when adjusted for population. Residential energy conservation today in the United States receives an annual funding of about $500 million; thus, the U.S. program is about one-seventh as aggressive as the Canadian home insulation program.

Second, the program provided for low interest loans for commercial property owners and developers for making investments to

increase the energy efficiency of buildings like restaurants, shopping centers, and offices. The repayment terms of the loan were made attractive by assuring that the repayment period exceeds the estimated payback of the conservation investment. A $25 billion revolving fund was established to provide the funds for these low interest loans.

Third, the program included a series of incentives to accelerate increased energy efficiency measures by industry. Research and development efforts that will increase industrial process efficiency were given a major increase in funding. It created a loan forgiveness program for engineering grants so that industrial firms would be encouraged to study the cost-effectiveness of altering their systems. These loans would be repaid only if the study established that investment in a more efficient industrial process was cost-effective. Thus, the government was taking a risk that the programs it believed were in the national interest, were also in the corporation's interest. Finally, the industrial conservation program provided an incentive of a $15 per barrel rebate for every barrel of oil saved in the year following the investment of funds to increase industrial process efficiency.

This program recognized that the national interest in reducing oil imports and increasing energy conservation was different than a single corporation's interest in increasing its profits. A higher incentive was necessary so that corporations could invest up to the level of the national interest rather than their own corporate interest.

But as comprehensive as the Kennedy-Durkin bill was, it did not meet the standard of a truly national conservation effort.

The Kennedy-Durkin initiative properly proposed a very large package of economic incentives--$58 billion in Federal costs. It did not, however, include off-budget financing or similar mechanisms to insure a long-term financial commitment to the program.

The harmful impact of the lack of guaranteed funding can be seen in comparing the fiscal year 1981 appropriations decision on energy conservation and synthetic fuels.A small element of the Kennedy-Durkin initiative was enacted in the Solar and Conservation Bank as an increased authorization for incentives for industrial conservation research and development. The Bank included a modified residential grant and loan program. Inspite of these demonstations of increased Congressional commitment to energy conservation, the conservation budget increased by only 20 percent while synthetic fuel funding will increase by 290 percent.

Thus, the special Treasury fund dedicated to synfuels has caused a dramatic expansion in synfuel funding while conservation incentives have remained essentially static after inflation is taken into account.

The Kennedy-Durkin proposal could also have been improved through the inclusion of a broader set of incentives.

In the residential sector, an effective loan incentive program and increases in the tax credit should also be provided.

In the commercial buildings sector, expansion of the present schools and hospitals program should have been proposed to meet the unique needs of the public and nonprofit organization sectors, and tax credits should be available for commercial energy efficiency investment.

In the industrial area, the alternative of using the tax code to increase energy conservation, as well as broader Federal incentives to speed the introduction of new energy saving industrial processes should be included.

A broader plan should also include a major transportation efficiency program.

Finally, it is clear that conservation must be given a bureaucratic priority equivalent to the Energy Security Corporation. The establishment of the Solar and Conservation Bank within the Department of Housing and Urban Development was a positive step. However, placing this agency within another bureaucracy will leave energy conservation as a step child program in the HUD as it now is in the Department of Energy.

Conclusion

The central elements of a modified Kennedy-Durkin bill have been described in this report not because it is assumed that this energy conservation program is the best that could be devised. Indeed, it is the central thesis of this report that there is no "best" energy conservation incentive. Because a national energy conservation effort will involve virtually every household and business in the Nation, no single set of

incentives will work. For too long the energy conservation debate in the United States has been mired down in such issues as whether grants are superior to loans, tax credits, or utility conservation programs. Every one of these programs is a good program for some households and a poor incentive for others. Each one has inherent strengths and weaknesses. While the effort to develop effective programs is essential, the debate over the means has deflected debate from the critical question of whether national commitments will be made to develop conservation's energy potential.

Again, the example of synthetic fuels is instructive. From 1975 through 1979, Congress attempted to develop a synthetic fuel policy. Those debates centered on the program rather than policy issues. What would be the "best" incentive? Would a regulatory program be better than loan guarantees? Would a technology demonstration program be superior to financial incentives? Would purchase guarantees be superior to below market interest rates? Should the program be developed on a phased basis or through full commercial demonstrations? All of these questions are essential. However, as long as the debate was centered on these questions, no synthetic fuel program was launched. It was not until the fundamental policy decision was made to develop synthetic fuels that every incentive was justified, and that the program began to move.

Likewise, the character of the political debate must be transformed if energy conservation's full potential is to be developed.

The Kennedy-Durkin efforts achieved only limited success last year because the

opponents of the program succeeded in dissipating the political momentum behind energy conservation by dividing the pro-conservation proponents through a debate on whether loan, grants or utility programs were superior.

As soon as the debate was shifted, the energy conservation program that was produced became like the synthetic fuel program before 1979. Instead of being a national effort, it is a bureaucratic jumble. Instead of being aggressive, it is defensive. Instead of being identified as the heart of our energy policy, it became submerged into the synthetic fuel legislation to assuage the synfuel program's critics.

Since 1973, the world oil supply system has experienced two major crises which have sent shockwaves through the American economy. The recent war between Iran and Iraq again graphically illustrates the precariousness of the world economy.

It is a national tragedy that seven years after the first oil cutoff, our Nation has not developed a national energy conservation strategy. The consensus of rhetoric has not produced a commitment of national resources.

America's greatest energy resource is the ingenuity of its citizens and businesses. A rational energy conservation program will enlist the ingenuity of every citizen, and every workplace in a united effort to increase an energy security and protect our economic health.

It is time to establish a national energy conservation policy as comprehensive and imaginative as our energy problems are severe.

FOOTNOTES

1/ Energy in Transition: 1985-2010, (National Academy of Sciences, 1979), p. 5.

2/ AFL-CIO National Convention Resolution, December 1979.

3/ The Easy Path Energy Plan, (Cambridge, Massachusetts: Union of Concerned Scientists, May 30, 1979), p. 1.

4/ Robert Stobaugh and Daniel Yergin. Energy Future, (Random House, 1979), pp. 180-82.

5/ Testimony of the National Association of Manufacturers before the Senate Finance Taxation and Debt Management Subcommittee, September 29, 1980, p. 1.

6/ Energy Outlook: 1980-2000, (Exxon Corporation, December 1979), p. 6.

7/ Ibid.

8/ Roger Sant, The Least-Cost Energy Strategy, (Energy Productivity Center, Carnegie-Mellon University Press, 1979), p. 29.

9/ Good News About Energy, (Council on Environmental Quality), p. 32.

10/ Energy in America's Future, (Resources for the Future, 1979), p. 338.

11/ Widmer and Gyftopoulos, "Energy Conservation and a Healthy Economy," Technology Review, June 1977.

12/ Exxon Corporation, op. cit., p. 6.

13/ Stobaugh and Yergin, loc. cit., p. 180.

14/ Sant, op. cit.

15/ M.H. Ross and R.H. Williams, "Drilling for Oil and Gas in Our Buildings," (Princeton Center for Energy and Environmental Studies, 1980).

16/ See Residential Energy Conservation, Office of Technology Assessment, July 1979, p. 22. See also "Response to DOE Analysis of Energy Savings," Memo from Richard Rowberg, Office of Technology Assessment, to the Joint Economic Committee Staff, October 2, 1980.

17/ Press Release, (American Petroleum Institute, April 2, 1980).

18/ Exxon Corporation, op. cit., p. 8.

19/ Energy Conservation in New Buildings, (Consumer Energy Council, April 1980), p. II-36.

20/ Synthetic Fuels, (Report by the Subcommittee on Synthetic Fuels of the Senate Budget Committee, September 27, 1979), pp. 40-44.

21/ There are indications that this trend will continue unaltered. A May 17, 1980 confidential memo by Energy Secretary Duncan to top aide outlined "tentative decisions" for energy spending in FY 1982-86. Conservation's share of energy research and development monies fell from 12 percent to 9 percent, while nuclear's rose from 21 percent to 24 percent, and fossil fuels was increased from 16 percent to 19 percent.

22/ An Analysis of Federal Incentives Used to Stimulate Production, (U.S. Department of Energy, Battelle Memorial Institute, December 1978), Contract No. EY-76-C-06-1830.

23/ Wall Street Journal, December 15, 1970, p. 8.

24/ Special Analysis, (Budget of the United States Government, FY 1981).

25/ Civil Engineering, May 1980, p. 55.

26/ "Energy Conservation: A Expanding Program Needing More Direction,"(General Accounting Office, July 24, 1980), pp. 11-12.

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