

[COMMITTEE PRINT]

**ENERGY PROGRAM**

**9**

**BUSINESS ENERGY TAX CREDITS FOR  
CONSERVATION AND CONVERSION**

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PREPARED FOR THE  
COMMITTEE ON WAYS AND MEANS  
HOUSE OF REPRESENTATIVES  
BY THE STAFF OF THE  
JOINT COMMITTEE ON TAXATION



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## I. INTRODUCTION

This pamphlet is the ninth in a series prepared for use by the Committee on Ways and Means during its consideration of the tax proposals recommended to Congress as part of the Administration's energy program.

The first section of the pamphlet presents background material that is focused primarily on the economic and energy use implications of the business tax credits. The second section contains a summary of the investment credit in present law as it relates to the types of property covered in the Administration's recommendation which is summarized in section III. The next section presents a summary of other proposals relating to business conversion and conservation credits that have been made in the 95th Congress. Section V contains a description of legislative activity in the 94th Congress on these and related matters. The legislative summary includes matters taken up in H.R. 6860 in the House and the Senate and in title XX of the Tax Reform Act of 1976 (as passed by the Senate). The pamphlet concludes with a section on matters relating to the business energy tax credit that the committee may wish to consider.

In the 94th Congress, the major bill considered in connection with energy tax proposals was H.R. 6860. This bill was reported by the Ways and Means Committee and was amended on the House floor. Markup sessions on H.R. 6860 were held by the Finance Committee in July 1975, and tentative decisions were made in many areas, but the bill was not reported at that time. Many of the provisions approved by the Finance Committee were added to H.R. 10612, the Tax Reform Act of 1976, as Title XX, but all of the energy provisions were deleted in conference. In August 1976 the Finance Committee reported the provisions of Title XX (as passed by the Senate) as an amended version of H.R. 6860. This bill was never taken up on the Senate floor and the provisions expired with the adjournment of the 94th Congress.

Unless otherwise indicated, the provisions discussed below with respect to action in the 94th Congress reflect H.R. 6860 as approved by the Ways and Means Committee. Also, unless otherwise specifically indicated, references to the Finance Committee bill refer to title XX of the Tax Reform Act (as passed by the Senate) and to the Finance Committee's reported version of H.R. 6860. Amendments on the House floor or on the Senate floor (to Title XX of the Tax Reform bill) are specifically noted.

## II. BACKGROUND

### A. General

The recommendation for business energy tax credits has two major objectives. The first is the conversion by industrial firms and utilities from using oil and natural gas as fuels to coal, solar energy and other fuel or energy sources that are more abundant or renewable. The second objective is to stimulate the installation of conservation equipment that will reduce the amount of energy consumed in heating or cooling a building or structure or in carrying out an industrial or manufacturing process. The proposed energy tax credit for conversion or more efficient energy property is limited to retrofits, which are generally the replacement of equipment in an existing activity. The economic and industrial considerations relevant to these changes are discussed in this section.

Over the past two hundred years, the United States has experienced a transition in primary fuel from wood to coal to petroleum and to natural gas. In this century, there has been a substantial increase in the use of natural gas and fuels refined from petroleum. While industrial production also increased during the period from 1950 to 1970, the Federal Reserve Index of Industrial Production showed an overall growth of 137 percent while industrial energy use grew only 73 percent. Thus, even though real industrial energy prices declined during those years, the energy consuming industries achieved an efficiency improvement averaging approximately 1.5 percent per year. Principal reasons for this improvement were:

- (i) **Conversion from coal to gas and oil.**
  - (ii) A geographical shift in industrial production from colder to warmer climates.
  - (iii) Increases in the size of individual plants made it economic to recover heat formerly wasted and use it for other internal purposes.
  - (iv) **High growth rates meant more production from new plants with efficiency improvements based on having the latest technology designed into the plants.**
- Manufacturing and electric utilities consumed more than 85 percent of industrial energy use in 1974 (see table 1).

TABLE 1.—*Industrial energy consumption, 1974*

[In trillion Btu's]

Industry group	Coal	Oil <sup>1</sup>	Natural gas	Electricity	Other	Total
Manufacturing-----	3, 642. 0	4, 420. 2	8, 109. 1	2, 092. 0	1, 842. 9	20, 106. 2
Food and kindred products-----	75. 3	132. 3	475. 6	126. 7	124. 8	934. 7
Tobacco products-----	5. 5	5. 2	4. 5	3. 5	. 3	19. 0
Textile mill products-----	22. 0	62. 7	102. 1	91. 8	38. 1	316. 7
Apparel-----	1. 0	5. 7	15. 4	25. 0	17. 9	64. 0
Lumber and wood-----	2. 8	42. 4	72. 9	50. 5	84. 7	253. 3
Furniture and fixtures-----	2. 8	7. 6	25. 3	14. 2	9. 1	59. 0
Paper and allied products-----	208. 8	576. 4	414. 3	132. 7	891. 6	2, 223. 8
Printing and publishing-----	. 4	7. 2	31. 4	31. 5	18. 2	88. 7
Chemicals-----	322. 2	2, 085. 4	2, 092. 6	436. 9	274. 0	5, 211. 0
Petroleum-----	5. 3	745. 3	2, 154. 5	83. 7	83. 2	3, 072. 0
Rubber-----	29. 6	44. 0	86. 6	64. 7	26. 0	250. 9
Leather-----	1. 3	6. 3	5. 2	5. 5	3. 5	21. 8
Stone, clay, and glass-----	233. 0	125. 5	696. 3	99. 6	146. 9	1, 301. 3

See footnotes at end of table.

TABLE 1. *Industrial energy consumption, 1974—Continued*  
[In trillion Btu's]

Industry group	Coal	Oil <sup>1</sup>	Natural gas	Electricity	Other	Total
Manufacturing—Continued						
Primary metals.....	2,639.2	418.7	1,284.3	536.3	<sup>2</sup> (76.1)	4,802.4
Fabricated metal products.....	11.1	38.9	208.2	88.4	60.7	407.3
Machinery.....	20.1	33.5	164.3	90.7	52.5	361.1
Electrical equipment.....	13.2	21.4	96.9	84.2	31.0	246.7
Transportation equipment.....	47.6	40.5	144.1	97.1	41.1	370.4
Instruments.....		12.7	15.8	15.6	6.4	50.5
Miscellaneous manufacturing..	.8	8.5	18.8	13.4	9.0	50.5
Agriculture.....	.8	1,129.2	167.6	109.2		1,406.8
Mining.....	39.4	256.2	1,369.0	142.1	123.4	1,930.1
Construction.....		1,830.5		15.3	9.3	1,855.1
Electric utilities.....	8,562.8	3,275.8	3,463.7	<sup>3</sup> (6,363.3)	2,248.7	11,187.7
Total.....	12,245.0	10,911.9	13,109.4	<sup>3</sup> (4,004.7)	4,224.3	36,485.9

<sup>1</sup> Includes liquefied petroleum gas (LPG).

<sup>2</sup> Steel industry produces coke, regarded as a fuel.

<sup>3</sup> Figures in parentheses mean energy produced in excess of needs for consumption.

Source: Federal Energy Administration.

The cost of energy purchased by manufacturing firms in 1974, as fuel or electricity, was 1.9 percent of the value of shipments.

TABLE 1A.—*Value of shipments and the cost of purchased fuels and electricity for manufacturing industries, 1974*

[Dollar amounts in millions]

Industry group	Value of shipments	Cost of purchased energy	Cost of purchased energy as percent of value of shipments
Food and kindred products	\$162,104	\$1,449	0.9
Tobacco products	7,140	39	.5
Textile mill products	32,892	692	2.1
Apparel	30,551	171	.6
Lumber and wood	26,853	482	1.8
Furniture and fixtures	13,197	128	1.0
Paper and allied products	41,665	1,905	4.6
Printing and publishing	35,822	244	.7
Chemicals	83,801	3,428	4.1
Petroleum	58,876	1,262	2.1
Rubber	27,902	538	1.9
Leather	6,177	53	.9
Stone, clay, and glass	26,260	1,554	5.9
Primary metals	95,618	4,193	4.4
Fabricated metal products	67,570	820	1.2
Machinery	92,487	776	.8
Electrical equipment	65,804	607	.9
Transportation equipment	108,245	829	.8
Instruments	20,865	104	.8
Miscellaneous manufacturing	14,044	129	.9
<b>Total, manufacturing</b>	<b>1,017,873</b>	<b>19,462</b>	<b>1.9</b>

Source: 1974 Census of Manufacturers, Bureau of the Census, Department of Commerce.

There are a number of ways industry can improve the efficiency with which it uses energy. Some of these ways, such as basic house-keeping, do not require new technology, but they simply call for a more careful use of the existing stock of capital equipment. Other approaches, such as peak-load pricing, involve a reorganization of the consumer price structure motivate energy savings. Another approach is to alter the existing stock of capital equipment through retrofitting. Finally, new additions to the stock of capital equipment can be made to be more energy efficient than the machines they replace, or they can use such renewable resources as solar and geothermal energy.

Overall, it is estimated that new plants could consume up to 40 percent less energy than their present day counterparts. If energy prices remain low, there will be less incentive to strive for these savings; high prices will lead to greater savings. The overall effects of the benefits in new plants will be moderated, however, by the number of present plants still in service.

Approximately 50 percent of present plants will still be in service in the year 2000. The cost of retrofitting one of these plants for maximum energy efficiency will be several-fold greater than the cost of including the conservation features in a brand new plant of the same type and capacity. However, the capital needs to retrofit electric utility plants will still be smaller, however, than those required for meeting equivalent energy demand through construction of new electric utility plants in the same time period.

In the background material that follows, conversion, cogeneration and industrial insulation are discussed as they relate to the Administration's proposals.

#### **B. Conversion to coal**

Effectively encouraging industry to switch from oil and natural gas involves the consideration of a number of related matters: first, the ability of the coal and transportation industries to meet the additional demands on their productive capacities; second, the economic feasibility of such conversions—in terms of retrofitting existing energy systems and the economics of purchasing new systems; third, the ability of the capital goods industry to supply large numbers of coal fired energy systems—primarily coal fired boilers for the production of industrial steam; and fourth, the technical feasibility of such conversions. These questions involve consideration of what are the current industrial sources of energy and the extent to which coal can be substituted in their place. Related to them is the extent of mandatory conversions ordered by FEA.

##### *Coal supply and transportation*

Coal is the most abundant fossil fuel available in the United States. The known reserves are sufficient to meet domestic needs for several centuries. The reserves are concentrated in the Appalachians and in the northern mountain states, but they also are found throughout the country in varying amounts and quality. Coal is most important immediately because of its suitability as a fuel substitute for oil and gas, its potential use as a source of synthetic oil and gas and its lower price per Btu than oil. Its drawbacks are the environmental impact and the capital costs associated with its extraction, transportation and use.

Coal production generally is described as being demand limited, that is, the level of production is determined by the demand for it, as illustrated by the increases in production and consumption since 1968. Consumers of large amounts of coal, primarily electric utilities and some industrial firms, tend to sign contracts directly with mine owners for all or a specific portion of the mine's output. Several years of lead-time are necessary between the decision to open a mine and the start of production. A new surface mine usually can be brought into production in one to three years in contrast with a new underground mine for which four to five years usually are needed before

the start of production. Irrespective of the site and the type of mining operation, the process of opening a new mine includes building roads for trucks and roadbeds for railroad cars as well as other types of construction related to transporting coal from the mine to the consumer.

Coal is transported from the mine to the consumer primarily by train. In 1974, railroads carried 66 percent of the coal that moved between mines and consumers. Water transportation and trucks, respectively, carried 11 percent of the total. The rest was carried in miscellaneous forms, including a small amount by slurry pipelines. Nearly 40 percent of the coal carried by railroads is carried by unit trains.

The proposed national energy program, as presented by the Administration, calls for continued, substantial increases in coal consumption by industry and electric utilities that will continue the pattern that began after 1973—a substantial shift from oil and natural gas to coal, nuclear fuel or other sources. The ability of the coal industry to provide sufficient output has been demonstrated by the production increases in the past several years. Even more rapid increases may be necessary in the future as the electric utility industry is shifted completely from reliance on oil and gas.

Coal production in 1977 is estimated to be 700 million tons, an increase of 35 million tons (or 5 percent) over 1976. Projections made in 1976 as a result of surveys by the National Coal Association and FEA indicate current plans to expand coal production capacity over 1976 levels by about two-thirds by 1985, to 1 billion tons. These expansion plans were developed on the assumption that difficulties (if any) with the size of the available labor force and transportation systems would not seriously restrict deliveries of coal to consumers. The Administration proposal would increase the 1985 production target by 200 million tons.

#### *Technical feasibility of coal conversion*

Total domestic demand for petroleum products and natural gas in 1976 was 55.2 quadrillion BTU's (quads). The industrial sector consumed 6.2 quads of petroleum and 8.5 quads of natural gas. The household sector consumed 14.5 quads of petroleum and gas, the transportation sector consumed 19.3 quads of which 18.7 quads were of petroleum, and the electric utilities consumed 6.6 quads. Table 2 displays the domestic consumption of petroleum products and natural gas by major product and major consuming sector.

Conversion to coal involves a shift by the industrial and electric generating sectors from oil and gas. Currently, they use about 21 quadrillion BTU's of energy annually. Coal cannot, however, replace oil and gas for all industrial uses. The primary industrial area in which conversion to coal is feasible is the generation of process steam which essentially involves using coal fired steam boilers instead of gas or oil fired boilers. This conversion generally cannot be achieved by refitting a gas or oil boiler so that it can use coal, unless the boiler was originally a coal boiler which was converted to gas or oil. The Administration estimates that of the industrial oil and gas energy used for boilers, about .9 quads of boiler capacity are convertible to coal. The Administration also estimates that there are an additional 5.8 quads of coal-compatible non-boiler uses that currently rely on oil and gas; for new units, non-boiler uses of coal represent 60 percent of the potential for increased coal use.

TABLE 2.—Domestic consumption of petroleum products and natural gas, by major product and major consuming sector, 1976 (estimated)

[In quadrillion Btu]

	House- hold and commer- cial	Indus- trial	Trans- porta- tion <sup>1</sup>	Elec- tricity genera- tion, utilities	Total domestic product demand <sup>2</sup>
<b>Petroleum products:<sup>2</sup></b>					
<b>Fuel and power:</b>					
Liquefied gases <sup>3</sup> .....	0.682	40.281	0.108		1.071
Jet fuels.....			2.007	0.017	2.024
Gasoline.....			13.440		13.440
Kerosene.....	.269	.078			.347
Distillate fuel.....	3.144	.814	2.216	.419	6.630
Residual fuel.....	1.169	1.232	.798	3.043	6.279
Still gas.....		1.092			1.092
Petroleum coke.....		.386			.385
<b>Total.....</b>	<b>5.264</b>	<b>3.883</b>	<b>18.569</b>	<b>3.479</b>	<b>31.268</b>
<b>Raw material:<sup>5</sup></b>					
Plant condensate.....		.019			.019
Special naphthas.....		.157			.157
Lubes and waxes.....		.221	.164		.384
Petroleum coke.....		.157			.157
Asphalt and road oil.....	1.068				1.068
Petrochemical feedstock offtake:					
Liquefied refinery gas <sup>6</sup> .....		.160			.160
Liquefied petro- leum gas <sup>6,7</sup> .....		.720			.720
Naptha.....		.402			.402
Still gas.....		.099			.099
Miscellaneous.....		.350			.350
<b>Total.....</b>	<b>1.068</b>	<b>2.283</b>	<b>.164</b>		<b>3.515</b>
Miscellaneous and unaccounted for.....					.155
<b>Grand total, petroleum products.....</b>	<b>6.333</b>	<b>6.166</b>	<b>18.733</b>	<b>3.479</b>	<b>34.938</b>

See footnotes at end of table.

TABLE 2.—Domestic consumption of petroleum products and natural gas, by major product and major consuming sector, 1976 (estimated)—Continued

[In quadrillion Btu]

	Household and commercial	Industrial	Transportation <sup>1</sup>	Electricity generation, utilities	Total domestic product demand <sup>8</sup>
Natural gas: <sup>9</sup>					
Fuels and power..... <sup>10</sup>	8.117	7.755 <sup>11</sup>	582 <sup>12</sup>	3.134	19.588
Raw materials (chemicals).....		.628			.628
Grand total, natural gas.....	8.117	8.383	.582	3.134	20.216
Total petroleum and natural gas consumption.....	14.450	14.649	19.315	6.613	55.153

<sup>1</sup> Includes bunkers, military transportation, and all military use of distillate and residual fuel oils.

<sup>2</sup> Includes liquefied refinery gas and natural gas liquids.

<sup>3</sup> Includes liquefied refinery gases (made from petroleum) and liquefied petroleum gases (made from natural gas). Examples are propane, butane, and ethylene.

<sup>4</sup> Includes secondary recovery of petroleum and agriculture uses.

<sup>5</sup> Includes some fuel and power used by raw materials industries.

<sup>6</sup> Includes ethane.

<sup>7</sup> Includes LP gas for synthetic rubber.

<sup>8</sup> Includes miscellaneous and unaccounted for users, not shown separately.

<sup>9</sup> Does not include use of 2.4 quads for production of liquefied petroleum gases.

<sup>10</sup> Includes 0.247 quads delivered to municipalities and public authorities for heating, etc.

<sup>11</sup> Includes approximately 1.4 quads used as fuel in gas fields and by natural gas processing plants.

<sup>12</sup> Consists of fuel used by natural gas pipelines.

Source: U.S. Bureau of Mines.

*FEA authority to mandate conversion to coal*

Under certain circumstances, the Administrator of FEA is authorized to prohibit powerplants and major fuel burning installations from burning natural gas or petroleum products as their primary energy source and to require that the powerplants and installations be designed and constructed to burn coal as a primary energy source.

Under certain circumstances, the Administrator of FEA is authorized to prohibit powerplants from burning natural gas or petroleum products as their primary energy source and to require that the new powerplants and major fuel burning installations be designed and

constructed to burn coal as a primary energy source. Under the Energy Supply and Environmental Coordination Act of 1974 (ESECA), the Administrator of FEA has mandatory authority to issue orders prohibiting any electric utility with the capability to burn coal from burning natural gas or petroleum products as a primary energy source. In addition, ESECA provides FEA with discretionary authority over other major fuel burning installations. Prohibiting consumption of natural gas or oil, in effect, forces conversion to coal. Several conditions must be met before FEA can issue such orders. First, the conversions must be technically feasible; the powerplant must have had the capability and plant equipment necessary to burn coal as of June 22, 1974. In addition, before issuing orders, FEA must determine:

- (1) that burning coal is both practicable and consistent with the purposes of ESECA;
- (2) that coal as well as the facilities necessary to transport coal to end users will be available during the effective period of the order; and
- (3) that the order will not impair the reliability of service in cases where power plants are issued orders.

ESECA also authorizes FEA to allocate coal, if necessary, to carry out the purposes of the act. The FEA authority to issue orders expires June 30, 1975, and the authority to amend, repeal, rescind, modify or enforce such orders expires December 31, 1978.

FEA must make the determinations described above on technical and economic feasibility and practicability before orders may be issued. However, before such orders become effective, EPA must make certain findings with respect to the capability of the facility to comply with air pollution requirements. EPA also has the authority to suspend FEA orders under certain circumstances. These interactions with EPA are a major part of ESECA.

Table 3 displays FEA's estimated annual energy impact of issuing conversion orders to new and existing power plants. In 1977, 20,378 megawatts would be affected, or about 12 percent of existing oil and gas fired utility capacity. Table 4 displays the maximum energy impact of issuing conversion orders to new and existing major fuel burning installations. FEA has identified 1,242 combustor units which had previously burned coal or were built with coal burning capability.

#### *Boiler stock and capacity of boiler industry*

Beginning in the 1950's, industry shifted from coal to oil and gas fired boilers. These were package oil or gas boilers that generally were available in smaller units than coal boilers. Accordingly, one industrial plant would typically install several package boilers dispersed among its buildings, whereas previously, it had one, central (usually coal fired) boiler. Only 4.7 percent of the units built in the 1970's used coal as a primary fuel.

The average age of the stock of boilers has declined. About 50 percent of the units recently surveyed were installed since 1960, and 20 percent since 1970. Half of the coal-capable MFBI's were built before 1950. About 80 percent of the individual MFBI units fall below 300 million Btu/hour. Currently, about 21 percent of all boilers burn coal; 43 percent burn natural gas. MFBI combustors consume 9 percent of national fossil-fuel consumption and about 51 percent of industrial consumption.

TABLE 3.—Maximum annual energy impact of issuing orders to new and existing powerplants

Year:	Capacity affected (MW)	ESECA program savings <sup>1</sup>		ESECA program coal—demand <sup>1</sup> (thousands of tons)
		Oil (thousands of barrels)	Gas <sup>2</sup> (millions of cubic feet)	
1977 <sup>3</sup> .....	20,378	65,079	79,360	21,869
1980.....	36,119	189,484	153,180	60,352
1985.....	<sup>4</sup> 85,220	189,484	153,180	60,352

<sup>1</sup>This data does not reflect changes in plant load factors from 1973 to the respective year of analysis. Decreasing capacity would result in decreased fuel consumption and therefore an overstatement of fuel savings and demand.

<sup>2</sup>These gas savings also can be expressed in equivalent barrels of oil as approximately 13,307,000 barrels in 1977 and 25,689,000 barrels in 1980 and 1985.

<sup>3</sup>Assumes conversion by July 1, 1977.

<sup>4</sup>Megawatt capacity affected in 1985 includes additional capacity from new powerplants, where it is assumed that coal would have been burned regardless of ESECA construction orders. Therefore ESECA program oil and gas savings and coal demand presented in this table will not show any change in energy impacts due to new powerplant operation.

Source: FEA, *Coal Conversion Program* (May 1977)

TABLE 4.—Maximum annual energy impact of issuing orders to new and existing major fuel burning installations

Year:	ESECA program savings <sup>1</sup>		ESECA program coal—Demand <sup>1</sup> (thousands of tons)
	Oil (thousands of bbls)	Gas <sup>2</sup> (millions of cubic feet)	
1977 <sup>3,4</sup> .....	6,191–12,383	34,316–68,632	2,843–5,686
1980.....	81,341	494,547	39,312
1985.....	113,602	815,992	59,206

<sup>1</sup>These data do not reflect changes in plant load factors from 1973 to the respective year of analysis. Decreasing capacity would result in decreased fuel consumption and therefore an overstatement of fuel savings and demand.

<sup>2</sup>These gas savings also can be expressed in equivalent barrels of oil as approximately 11.2 million barrels in 1977 and 31.8 million barrels in 1980 and 83.3 million barrels in 1985.

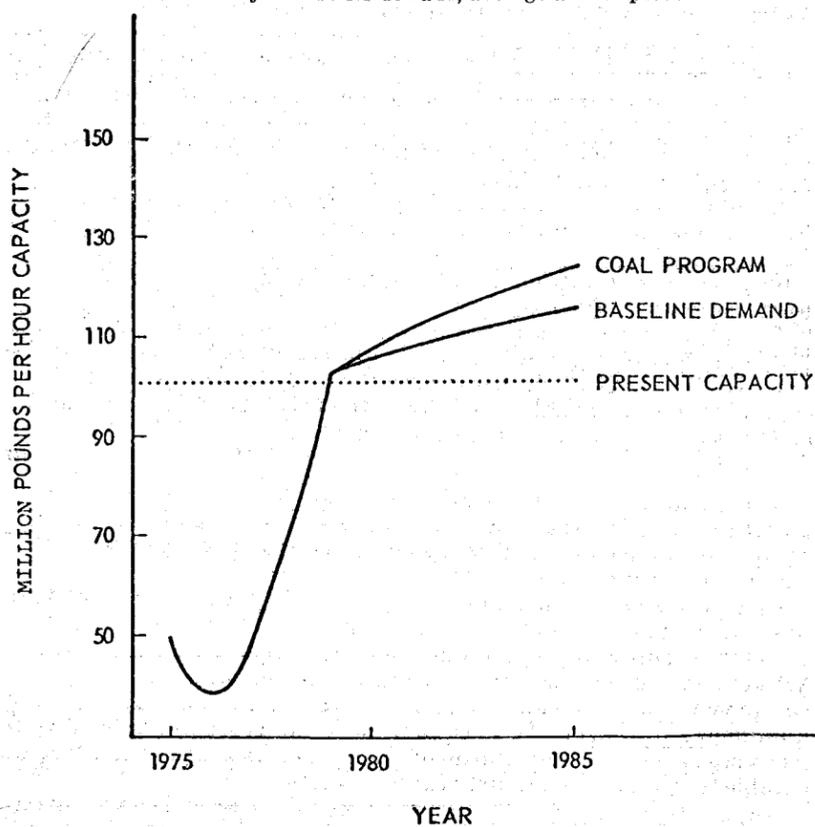
<sup>3</sup>Assumes conversion by July 1, 1977.

<sup>4</sup>A range of oil and gas savings and coal demand is presented for 1977 since delays could occur in conversion of MFBI due to upgrading, if necessary, of particulate control equipment to comply with applicable State Implementation Plan (SIP) particulate emission requirements. The figures for the lower bound of the range represent 50 percent of maximum impact in 1977.

Source: FEA, *Coal Conversion Program* (May, 1977).

Boiler sales are now only about 50 percent of the previous peak (1973) levels. Figure 1 displays the Administration's estimates of boiler capacity measured in million pounds per hour capacity. The Administration projects that the coal conversion program will not materially increase the demand for boilers beyond the base case. At least initially, the Administration projects that demand under the base case and under the President's program will be the same through 1979, because most new orders are now for coal-fired units. At that time, demand should hit 1977 capacity levels.

FIGURE 1.—Projected boiler demand, average annual production



Source: Executive Office of the President, "Replacing Oil and Gas with Coal and other Fuels in the Industrial and Utility Sectors," June 2, 1977.

#### *Costs of Conversion*

Converting an oil or gas fired boiler to coal requires the installation of equipment that is not required for the additions include storage equipment and space, stoking equipment, ash-handling and disposal equipment. The additional costs were estimated in 1975, by the Federal Power Commission, as \$7.50 per kilowatt of capacity greater than for an oil fired plant.

Conversion to coal also entails investments in three primary air pollution control devices to reduce emissions of sulfur oxides and suspended particulates. The control technologies presently available to control pollutants are electrostatic precipitators (ESP) and bag-houses for particulate (dust) control and flue gas desulfurization (FGD) for sulfur oxide removal.

All of the power plants now using oil which had burned coal in the past have ESP units installed. The quality of many of these ESP units has deteriorated significantly, however, because they were not needed to meet State emission regulations when the power plants burned oil. Now many ESP units may need to be replaced or upgraded.

Besides using naturally occurring low sulfur or physically desulfurized coal, FGD is the only technology available now for utilities to comply with sulfur regulations. Cost estimates for FGD span a wide range, with capital costs ranging from \$35 to \$120 per kilowatt of capacity and operating costs estimated at one to six mills per kilowatt hour.

Installation of FGD equipment will entail additional solid waste handling costs which vary according to the type of FGD equipment installed, whether the system produces salable by-products, such as elemental sulfur or sulfuric acid, or produces a sludge which must be treated and stored. FGD capital costs are considerably lower for new power plants because FGD equipment can be designed as part of the entire power plant configuration.

The annual costs of conversion from oil to coal for a group of 74 power plants are shown in Table 5, as they were estimated by the Federal Power Commission for the Federal Energy Administration.

TABLE 5.—*Capital costs and annualized cost savings from oil-to-coal conversions*

	1977			1980	
	Primary standards	Regional limitation	Significant risk	SIP <sup>1</sup>	Base case
Converted capacity (MW).....	12,051	7,719	6,282	24,392	24,392
Total capital costs (millions).....	\$180	\$145	\$96	\$1,140	\$319
Capital cost per kilowatt of capacity..	\$15	\$19	\$15	\$59	\$13
Annual cost savings (millions):					
\$23 per ton.....	\$430	\$245	\$215	\$445	\$1,001
\$35 per ton.....	\$131	\$54	\$59	-\$158	\$398

<sup>1</sup> State Implementation Plan.

Source: Federal Energy Administration, *Coal Conversion Program* (December 1975) p. 191.

The costs of converting individual plants will depend upon: (1) the pollution control equipment required, (2) boiler and conversion costs (which vary significantly among plants<sup>1</sup>), (3) the remaining useful life of existing facilities, and (4) capacity factors. Obviously, specific plants will also be confronted with varying oil and coal prices depending upon location, transportation links, quality of fuel required and fuel contract terms.

The most important factors are the price of coal and the configuration of pollution control equipment required on the plants. Changes in the oil price, which is held constant at \$12 per barrel in these examples, would clearly alter the economic cost-benefit comparisons.

Table 6 displays the cost savings available for a representative 500 megawatt plant with alternative assumptions about pollution control, capacity utilization rates, and coal prices. Assuming no need for environmental control equipment, 55% utilization rate, and \$23 coal, savings of conversion will be \$19.5 million/year as compared to an oil fired plant. At high coal prices, low utilization rates, and flue gas desulfurization equipment installed, the coal plant is less economic.

TABLE 6.—*Annual cost savings for 500 megawatt plant*  
[In millions of dollars]

Types of plants	Capacity utilization rates/coal costs <sup>1</sup>			
	55 percent		37 percent	
	\$23 coal	\$35 coal	\$23 coal	\$35 coal
Existing:				
No environmental control equipment.....	19.5	7.2	12.7	4.3
Precipitator high-sulfur coal...	17.6	5.3	10.5	2.1
Precipitator low-sulfur coal...	7.3	-5.1	3.6	-4.7
Flue gas desulfurization.....	11.3	-1.1	3.1	-5.2
New: Flue gas desulfurization...	10.3	-2.1		

<sup>1</sup> Coal costs are assumed to be \$23 per ton of high-sulfur coal in the low cost case and \$35 per ton in the high cost case. Low-sulfur coal costs \$10 more per ton than high sulfur coal in both cases.

Source: FEA, *Coal Conversion Program*, December 1975.

### C. Cogeneration

#### General

In the United States, industry and utilities operate two large steam systems relatively independently and largely for different purposes. Industry generates steam principally for its use in manufacturing and heating, and only about 30 percent of this steam is used to generate electric power. The utilities generate steam almost solely to feed turbine-generators producing electricity, and only a very small percentage of the steam is sold to industry.

<sup>1</sup> A recent study for the FEA shows that conversion costs without environmental controls vary from zero to \$10.55 per kilowatt of capacity.

Several factors have contributed to this dual system of steam generation:

(i) Electric rates from central power stations decreased and encouraged the substitution of power for steam in some situations, thereby eroding the industrial steam base.

(ii) It is difficult to find and keep people able to handle the problems of coal-fired boilers. Gas and oil-fired packaged boilers which could operate almost unattended became available, but most of them were not suitable for power generation.

(iii) A continual increase in the average size of central power stations relative to industrial power generators. As a result, economies of scale favored central electric power stations.

(iv) A disinterest on the part of industrial management in generating power.

(v) Competitive policies by most privately owned electric utilities have discouraged electricity generation by any other organization. Rate schedules favored large industrial users and high charges for power to meet only peak requirements made it uneconomical to use the utility as a stand-by source of industrial power.

Industry has continued to generate steam because in most cases there was no good alternative, but the factors listed above have led to a shift from on-site electric power generation to the present dependence on central station (utility) generation and distribution. The result has been convenience and flexibility at low apparent cost, and the potential economies of by-product power generation have been largely overlooked.

About one-half of all industrial steam is produced at plants generating 250,000 pounds per hour or more, at each location. Almost one-quarter of the total industrial steam load is produced at plants generating 1,000,000 pounds per hour or more at single locations. A large percentage of this steam, however, comes from package oil and gas fired boilers operating at pressures and temperatures too low for by-product electric power generation.

Package boilers basically are assembled at the factory and shipped complete with fuel burning equipment, mechanical draft equipment, automatic controls, and accessories. Such boilers could be purchased on relatively short notice and even rented. They had the advantage of requiring a minimum of operating knowhow and attention, and could be installed for one-fourth or one-fifth the cost of coal-fired, field-assembled boilers. Package boilers are generally less efficient in fuel consumption than field-assembled boilers, and they generally cannot be converted to coal. As gas and oil become increasingly expensive and difficult to obtain, the economics increasingly favors coal-fired, field-assembled boilers.

Industry is utilizing only about 30 percent of its steam base for power generation. If the industrial steam base (at plants generating 250,000 pounds or more of steam per hour) were fully utilized, the power generated would provide about 55 percent of industry's electrical requirements.

Beyond that point, additional industrial capacity would generate surplus power which could be sold to near-by utilities. If the contiguous utility declined to purchase and a neighboring utility desired to purchase, the power would have to be wheeled over the transmission

lines belonging to the contiguous utility. It is not uncommon to find one utility performing this service for another utility, but it is rare to find a utility wheeling power for an industrial firm.

Currently, 23 percent of the industrial steam load is generated in amounts of 1,000,000 pounds per hour or more at single locations. If all new industrial and utility coal-fired power stations becoming operational after 1978 and all new nuclear power stations becoming operational after 1980 were dual purpose installations, 16 percent of the industrial steam load would be supplied by such stations in 1985. Fuel savings in that year would amount to about 1.13 quadrillion Btu's, roughly equivalent to 535,000 barrels per day of oil. Capital requirements would be approximately the same as for separate steam and power facilities.

#### *Environmental issues*

The sale to industry of steam from dual-purpose central power stations would not seem to raise any new environmental considerations. The conversion from natural gas package boilers to coal-fired boilers, however, could raise serious environmental issues, except where fluid bed combustors would be used.

#### *Economic and financial considerations*

The privately-owned electric utility industry recently faced serious economic and financial problems, stemming from the fact that electric rates have not kept pace with the costs of fuel, plant construction, and capital.

Savings from cogeneration in the nation's capital requirements to generate electricity over the period 1976 to 1985 mean that the nation could consume the same amount of electricity while building electric generating facilities at a lower annual cost of \$2 billion to \$5 billion. Accumulated savings over the period 1976 to 1985 could be \$20 billion to \$50 billion. As a result, resources valued at \$20 billion to \$50 billion could be freed for uses in other parts of the economy. The by-product power generation and joint venture central power stations would thus result in a significant increase in the productivity of the nation's resources. There are, however, substantial legal and regulatory impediments to cogeneration.

#### *Legal considerations*

In addition to the technical and economic considerations that affect the extent to which cogeneration may take place, there are several regulatory and legal considerations which also bear on the use of cogeneration techniques. In some respects, these regulatory and legal considerations may explain why cogeneration has not occurred more frequently.

Generally, the Federal Power Commission (FPC) has regulatory authority over electrical activity when the ultimate use of the power is for wholesale and interstate commerce, FPC authority covers rate regulation, oversight of capital expenditures, assessment of service adequacy, and the appropriate service area among other matters.

Cogeneration solely within a State would most likely require state regulatory commission review. Involved in such oversight would be a review of the adequacy of service, future requirements of service, the rate structure, and access to geographic areas. In addition, new

cogeneration enterprises probably would have to submit their capital spending plans to the state regulatory authority for review. As such firms come under either FPC or state regulatory review, that portion of their operations would be treated as a utility, and subject to all the rules, regulations, and case law which apply to electric utilities generally.

While cogeneration from a technological and economic point of view may be seen simply as better utilization of existing energy resources, from the point of view of the organization of the electric utility market, it is a radical departure from certain basic tenets. Essentially, cogeneration violates the geographic monopoly which has been accorded electric utilities. In return for a monopoly and a fair rate of return, electric utilities accept substantial regulation of rate setting, review of investment decisions, equity market activities and so forth. For a manufacturing firm to successfully engage in cogeneration, it must in effect become in part regulated.

To existing utilities, the addition of a competitor (e.g., a firm that could sell electricity to another firm) within its geographic area may not be viewed affirmatively. Also, if the firm with cogenerating power looks to the utility as the sole buyer of such electricity, it may find the utility unwilling to engage in such transactions because of potential supply uncertainties.

In the nontax portion of the Administration's energy program (sec. 522 of H.R. 6831), FEA would be authorized to exempt cogeneration activity from regulation by Federal, State or local government authorities.

#### ***D. Industrial conservation***

Industrial conservation can involve a number of different approaches. First, certain, almost costless short-term energy saving measures can be taken, such as, not illuminating unoccupied buildings. Second, many minor modifications of existing buildings and industrial processes can significantly reduce energy use. Painting ceilings white can easily result in using less energy for lighting, and insulating pipes or closing exhaust flues to conserve heat are energy saving modifications in industrial activities and structures. Third, a variety of major investments involving reconfigurations of industrial processes can yield energy savings.

For the firm, the decision to modify an existing structure by adding insulation, storm windows, or other conservation devices is very similar to the industrial investment decision. Savings from energy conservation investments accrue over time, so that future benefits need to be discounted by an appropriate rate of interest. The firm should be willing to invest in additional energy conservation measures up to the point where the additional cost of an investment in energy conservation is matched by the energy saving from that investment. Thus, it would not be economical to concentrate the entire energy conservation budget on, say, pipe insulation, when modest amounts of other insulation, e.g., weatherstripping, can yield substantial initial energy savings.

The conservation techniques a firm will choose to apply depend on the current energy loss, the relative prices and energy efficiencies of each conservation technique, and the price of the energy being used.

As the price of energy rises, the value of conservation investments

increases. Also, the more severe that the heat loss becomes, the more warranted conservation investments become.

It is widely believed that as a result of higher energy prices and the curtailments and interruptions in oil and gas supplies in 1973 and thereafter, business became far more aware of its rate of energy utilization than it had been previously. Numerous newspaper stories during the past several years have described the financial benefits of basic energy conservation. There are, however, no firm industry-wide estimates of the extent to which energy is being wasted, or the extent to which aggregate investments would yield particular patterns of returns. Estimates of energy savings from industrial insulation are being primarily on a judgmental basis by energy experts.

By the end of 1977, FEA will have developed a comprehensive set of specific industrial energy savings targets and a description, by industrial classification, of what is technically and economically feasible in terms of energy conservation.<sup>2</sup>

Structural insulation is a major industrial conservation device that can be adopted without changing industrial processes or procedures. The ability of plant managers to insulate their buildings depends in part on the price and availability of insulating materials.

Fiberglass is a major source of insulating materials, and it is produced by three firms in the United States. The volume of shipments of fiberglass by weight and the average price per pound, 1969-75, are shown in table 7. The price has fluctuated within a range of 24 to 35 cents per pound, and shipments have ranged between 900 million and 1.2 billion pounds per year. The 2 years with the lowest average prices (1971 and 1972) also were years with the two lowest shipments totals. In contrast, 1975 was the year with the third lowest shipments total, 1.1 billion pounds, and it was also the year with the highest average price. The last 3 years for which there are data show successively decreasing shipments and increasing prices.

TABLE 7.—*Volume by weight and price of fibrous glass shipments*<sup>1</sup>

Year	Shipments (thousands of pounds)	Average price per pound
1975.....	1, 103, 055	\$0. 346
1974.....	1, 162, 137	. 292
1973.....	1, 179, 686	. 262
1972.....	1, 054, 755	. 254
1971.....	890, 155	. 245
1970.....	1, 186, 294	. 299
1969.....	1, 202, 673	. 295

<sup>1</sup> Structural insulation for insulating homes, commercial and industrial buildings, Standard Industrial Classification Code 32961 15.

Source: U.S. Bureau of the Census, "Current Industrial Reports," series MA-32J, annual issues.

<sup>2</sup> See Federal Energy Administration, Industrial Conservation (draft) *Target Support Document, Energy Efficiency Improvement Targets* (selected industries).

Shipment totals have tended to be tied closely with the residential construction cycles—chiefly construction of new homes. Fiberglass insulating materials may be used in all types of structures. To the extent that residential construction is in a slump, the suppliers have ample production capacity to meet the needs of purchasers of insulating materials for already constructed residential, commercial and industrial structures.

There are no current indications that other components for energy saving and structural insulating components encounter limits to production capacities. This observation applies to such insulating materials as cellulose, rock wool, styrofoam and vermiculite, storm doors and windows and thermostats and other automatic temperature control devices.

### III. PRESENT LAW

Under present law, an investment credit of 10 percent (which reverts to 7 percent after 1980) is allowed generally for tangible personal property which is placed in service in a trade or business. (The credit could be as high as 11½ percent for employers with qualified employee stock ownership plans.) However, structural components of buildings, including insulation, storm windows and doors, solar energy equipment, etc., generally do not qualify for the credit. Otherwise eligible property placed in service in hotels and other businesses which cater to transients is eligible for the investment credit, but property placed in service in hotels and apartments which predominantly have permanent residents does not qualify for the credit.

The investment credit is also allowed for tangible property (other than buildings or their structural components) which is used in manufacturing, production, extraction or as an integral part of furnishing transportation, communications, or electrical, gas or other utility services; even though such tangible property may otherwise be considered real (and not personal) property under local law.

The extent to which the investment credit is available depends upon the estimated useful life used to depreciate or amortize the property for tax purposes. No investment credit is allowed if the property has an estimated useful life of less than 3 years. Where the useful life is greater than 3 years but less than 5 years, the investment credit is allowed on one-third of the taxpayer's cost for the property. Similarly, if the useful life of the property is greater than 5 years but less than 7 years, the credit is allowed on two-thirds of the cost, and the credit allowed is on the entire cost where the property has a useful life of 7 years or more. If the property on which the investment credit was claimed is later sold or otherwise ceases to be qualified property for the taxpayer before the end of its estimated useful life, the credit is partially or entirely recaptured to reflect the taxpayer's reduced holding period.

Generally, the amount of the investment credit a taxpayer may apply against his tax liability in any one year cannot exceed the first \$25,000 of tax liability plus 50 percent of the tax liability in excess of \$25,000. Special limitations have been provided for public utility property, under which the 50 percent limit was increased to 100 percent for 1975 and 1976, and is 90 percent for 1977, after which it declines by 10 percentage points in each succeeding year until it returns to the generally applicable 50-percent limit in 1981. Similar increases in the tax liability limitation are available (under the Tax Reform Act of 1976) to railroads and airlines, which are allowed to apply their investment credits against 100 percent of their tax liability for 1977 and 1978, and the limitation is reduced by 10 percentage points in each subsequent year until it returns to 50 percent in 1983.

Investment tax credits are not refundable. However, credits which are not applied against tax liability in the year they are earned may be carried back for 3 taxable years and carried forward for 7 years. In applying credits against tax liability for a particular tax year, the first-in first-out method is generally required, under which the credits earned in prior tax years are applied first, after which credits earned in the current year or later years are used.

Nontax provisions of present law also provide for loan guarantees to business and industry to assist in financing the purchase and installation of energy conservation or renewable resource energy equipment (as determined by the Federal Energy Administration) in existing buildings and industrial facilities. Under the Energy Conservation and Production Act (Public Law 94-385), loan guarantees are limited to \$5 million for any one borrower, and to 90 percent of the cost of the new installation. The total commitment under this guarantee program may not exceed \$2 billion, and it is scheduled to expire on September 30, 1979. No funds have been appropriated for this program, however, and no regulations have been issued.

#### IV. ADMINISTRATION PROPOSAL

##### *A. Description of recommendation*

The Administration proposal would amend the investment credit provisions to provide increased or new investment credits for a wide variety of energy-related tangible property used in a trade or business.

These credits would be available for qualifying business energy property, and the amount of the credit would vary depending on which of four specified categories of business energy property is involved.

New or additional credits would be available for qualifying new energy equipment acquired or constructed by the taxpayer after April 20, 1977, and placed in service before January 1, 1983. In each case, to qualify for the credit, the property would have to be an integral part of, or used in connection with, a building or other structure located in the United States which had been substantially completed on or before April 20, 1977. In addition, where the property is used in a manufacturing or production process, this process must have been carried on prior to April 20, 1977. The Administration did not intend that these credits be available to electric utilities, however the language of the bill does not specifically exclude them.

Under the Administration proposal, cogeneration equipment and alternative energy equipment are to receive a 20-percent investment credit, even after the regular investment credit returns to 7 percent on January 1, 1981 (4 percent for utilities). The credit for cogeneration and alternative energy property would not be available after 1982. The credit for cogeneration property would be given for property which produces steam heat, or other forms of useful energy, other than electric energy, but which also generates electrical energy in useful form. This property would have to meet minimum efficiency requirements prescribed by the Secretary, after consultation with the Federal Energy Administration.

The category of alternative energy property covers a broad range of onsite equipment that would use or facilitate the use of coal or another fuel as a substitute for petroleum, natural gas or a product derived from them. Alternative energy equipment would include boilers, combustors, facilities for converting coal into synthetic gas, equipment to manufacture coal-derived chemical feedstocks, coal handling and treatment equipment and also pollution control equipment that might be required by Federal, State, or local regulations to be installed in connection with the other items of qualifying alternative energy equipment.<sup>3</sup>

<sup>3</sup> Certain property that would qualify for the business energy tax credit might also qualify for the coal conversion rebate (discussed in Pamphlet 11) allowed in connection with the tax on industrial use of petroleum and natural gas. Under the Administration proposal, the taxpayer could not receive both the credit and the rebate for the same property.

With regard to pollution control equipment which qualifies as alternative energy property, present law provides that 5-year amortization may be elected for such property. If 5-year amortization is elected for pollution control property which has a useful life of greater than 4 years, the taxpayer will receive only 50 percent of the investment credit to which he would otherwise be entitled (i.e., a 5-percent credit until 1981). Under the Administration proposal such pollution control equipment which also qualifies as alternative energy property would consequently receive a credit of 10 percent (one-half of 20 percent). However, where such equipment is financed through the issuance of tax-exempt bonds, the taxpayer will be eligible to receive one-quarter of the allowable 20 percent credit, or 5 percent.

The third and fourth categories of business energy property which are eligible under the Administration bill are solar energy equipment and certain items of energy conservation equipment. To the extent property in these two categories is eligible to receive the 10-percent investment credit under present law, it will receive a credit of 20 percent until 1981 when the combined tax credit would decline to 17 percent. If property in these two categories is not presently eligible for the investment credit, it will receive a 10-percent credit through 1982, when these special investment credit incentives would expire.

Solar energy equipment is defined as equipment, used in connection with a building, which utilizes solar energy to heat or cool the building, heat water, or provide process heat. The Secretary of the Treasury is authorized to identify eligible items of solar energy equipment, after consultation with the Federal Energy Administration.

The items of energy conservation equipment which are eligible for the credit are defined as property which is installed for the primary purpose of reducing the amount of energy used to heat or cool a building or other structure, or to carry on any manufacturing or production process in the building or structure. In order to qualify as conservation property used to carry on a manufacturing or production process, the property must be new identifiable property which does not alter the manufacturing or production process, but merely reduces energy consumption in one or more steps of an existing process. The Secretary is also authorized to identify eligible property in this category, after consultation with the Federal Energy Administration. Items of property which are potentially eligible in this category include insulation, heat pumps, heat exchangers, waste heat boilers, and combustible gas recovery systems.

Under the Administration proposal, all of the business energy credits would be available in connection with property which is used in the furnishing of lodging (including lodging for permanent residents such as apartments), except where the qualified investment is also made in connection with low income housing which is eligible for rapid depreciation.

The additional ESOP related investment credits which are available under present law would also be available for property which qualified for the energy credits. Thus, for example, an investment credit of up to 21 percent would be available for cogeneration equipment, if the corporation made contributions equal to 1 percent of the cogeneration investment to an ESOP plan.

Recapture rules similar to those under present law are provided so that investment credits allowed in prior years will be recaptured if business energy property ceases to be section 38 property. In addition, where the property ceases to be business energy property qualifying under this proposal, the special credit will be recaptured. Recapture will occur where a change in the status of the property occurs before the lesser of either 7 years or the useful life used for purposes of computing the credit.

#### B. Energy savings

Table 8 displays the Administration's estimates of the energy savings which would result from its industrial conservation and tax program. The Administration estimates that in 1985 the mandatory conversion for large boilers will save .8 quadrillion BTUs (quads) of oil and .8 quads of natural gas, and increase coal consumption by 1.6 quads. The program of business tax credits is expected to reduce oil demand by industry by .17 quads and natural gas demand by .13 quads. The Administration also estimates that the business tax credits will result in reduced coal utilization by .25 quads. Coal utilization is expected to rise by 4.9 quads as a result of the business credits.

Overall, the Administration's programs will reduce the industrial use of oil by 6.4 quads. Coal utilization will rise by 4.9 quads. These effects reflect the overall impact of the regulatory and tax measures as they affect the industrial sector.

TABLE 8.—*Industrial energy savings of Administration's proposal in 1985*

[Quadrillions of Btu's]					
Program	Oil	Gas	Oil and gas total	Coal	Net total <sup>1</sup>
Regulatory <sup>2 3</sup> -----	-0.8	-0.8	-1.6	+1.6	0
Business tax credits <sup>4</sup> ---	-.17	-.13	-.30	-.25	-.55
Cogeneration <sup>4</sup> -----	-.03	+.04	+.01	-.40	-.39
Impact on industrial sector of overall program <sup>5 6</sup> -----	-6.4	0	-6.4	+4.9	-1.5

<sup>1</sup> Sum of oil, gas, and coal.

<sup>2</sup> Major fuel boiler conversions.

<sup>3</sup> Source: Energy Policy and Planning, "Replacing Oil and Gas With Coal and Other Fuels in the Industrial and Utility Sectors" (June 2, 1977), table 1-1.

<sup>4</sup> Source: FEA, Apr. 18, 1977.

<sup>5</sup> Includes regulatory, business tax credit, and cogeneration proposals as well as other industry related proposals.

<sup>6</sup> Source: Energy Policy and Planning, "The National Energy Plan," (Apr. 29, 1977), table IX-1.

## V. ALTERNATIVE PROPOSALS IN THE 95TH CONGRESS

### A. Members' proposals

#### *Mr. Vanik*

The total amount of any investment tax credit and energy tax credit available for any particular equipment or expenditure would be limited to 10 percent.

#### *Mr. Waggoner*

A 10 percent business energy tax credit would be provided in addition to the existing 10 percent investment credit; after 1980 the two credits would become a 20-percent investment credit, with the energy tax credit remaining in effect until 1988.

A full investment credit would be provided for the purchase of diesel truck engines with a useful life of 5 years or longer and a 50 percent credit would be provided for equipment with a 3-year useful life.

The 50 percent of tax liability limitation on the investment tax credit would be removed for all taxpayers.

The credit for coal conversion would be modified by moving the beginning qualifying date back to September 30, 1973 (the date of the Arab Oil Embargo) and broadening the definition of alternative energy property to include "coal derivatives", 10 percent BTU savers, and "facilities to convert coal into a usable fuel".

#### *Mr. Pickle*

The business credit for solar energy would be changed to 5-year amortization and expanded to include geothermal and wind energy equipment which are used to generate electricity or perform other energy saving functions.

Five-year amortization would be provided for the following types of equipment: equipment to use waste as a fuel, to process waste into a fuel, or to sort and prepare waste for recycling; equipment to reach, extract and convert shale rock into raw shale oil; coal slurry pipeline equipment; coal liquefaction and gasification equipment; and deep mining coal equipment. Such equipment would be limited to an investment credit equal to two-thirds of the normal rate and would not be eligible for the additional first year depreciation.

An additional 10-percent tax credit would be provided for investments for the manufacture of electric vehicles (excluding the manufacture of golf carts, snowmobiles and other similar recreational equipment).

Alternative energy property eligible for special treatment would include: coal fired boilers, or other boilers whose primary fuel was not oil or natural gas; facilities for converting coal into natural gas; other coal conversion equipment, including equipment relating to the processing and handling of coal, nuclear or any other type of non-oil or non-natural gas base generating unit which results in the utility having

to rely less on oil or natural gas base generation whether it is a conversion or new equipment; and pollution control equipment relating to coal.

Taxpayers would receive the alternative energy property credit on all investments made since September 30, 1973.

*Mr. Rangel*

Rapid amortization would be provided for equipment which uses waste as a fuel, processes waste into a fuel, or sorts and prepares waste for recycling.

*Mr. Jones*

A tax credit would be provided for investment in research and development of new energy sources, with a windfall profits tax applicable if the funds are not used to find new sources of energy.

A tax credit would be provided for wind-related business energy equipment. The credit would be 20 percent for equipment installed between 1977 and 1980 and 10 percent for equipment installed between 1980 and 1982.

*Mrs. Keys*

The business solar energy credit provision would include wind energy equipment.

The investment credit would be denied for purchases of any electrical generating equipment for generators fueled with petroleum, petroleum products or natural gas (but not with synthetic fuels made from coal).

*Mr. Tucker*

The limitations on tax-exempt industrial development bonds would not apply for bonds issued by state utilities for generating plants which are built according to strict conservation standards and which result in less dependence on foreign oil.

*Mr. Duncan*

Expenditures for coal conversion facilities, including buildings and equipment, would be eligible for 1-year rapid amortization treatment. Coal mining equipment would also be eligible for this immediate deduction.

Income from converting coal to a low-sulfur synthetic fuel would be eligible for the deduction for percentage depletion (at a 10-percent rate).

*Mr. Archer*

A one-year write off of expenditures for coal conversion of existing facilities would be allowed or, alternatively, a longer-term write off (e.g., 5 years) plus a two-thirds investment credit.

Electric utilities would be eligible for any energy tax credits, with the credits made refundable. The basic investment tax credit would be extended at a 10-percent rate to 1990.

Cogeneration property eligible for any tax credit would specifically include such property owned by an electric utility.

Electric utilities would be permitted an immediate income tax deduction for undepreciated costs of retired oil and gas-fired facilities.

*Mr. Vander Jagt*

The business energy tax credit would be extended to expenditures for the following purposes: the installation of methane generation equipment; the conversion of electric motors to the Wanlass concept; the use of recycled materials in manufacturing processes; the installation of self-contained human waste disposal facilities; and capital costs paid by business facilities for municipal sewage treatment facilities which incorporate recycling of waste water.

A tax credit would be provided for the use of recycled materials.

*Mr. Steiger*

All capital investments required to develop shale oil or coal gasification or liquefaction plants would be treated as expenses deductible in the year paid or incurred.

*Mr. Schulze*

Small businesses (i.e., those with 1,000 or fewer employees) which rent buildings would be eligible for an additional 10 percent energy tax credit for such energy conservation measures as building insulation, heating and cooling equipment, cogeneration equipment and alternative energy equipment. Commercial landlords of these small businesses would also be eligible for the additional credit to the extent the costs are jointly paid.

**B. Other proposals**

The business energy credit would be separated from the existing investment credit. Property that would qualify for the business energy tax credit would receive it in addition to any investment credit for which the property also may be eligible. The energy credit would be a flat 10 percent of qualifying expenditure, declining to 7 percent in 1983, 5 percent in 1985 and terminating after 1988. The business energy credit would be limited to 100 percent of tax liability, but it would qualify FIFO treatment of its credits and carrybacks and carryovers of excess credits.

Qualifying property could be specified more precisely than under the Administration's proposal, with no administrative authority to change the definition by regulation. Qualifying property could be limited to:

- (a) insulation and other property designed to heat or cool a building more efficiently,
- (b) equipment which utilizes energy sources other than oil or gas (such as solar energy) to provide heat, cooling or electricity in connection with an existing building or structure,
- (c) cogeneration equipment, but only where existing facilities are converted to cogeneration,
- (d) expenditures made in connection with converting existing oil or gas fired power plants and other combustors to coal or other sources of fuel or replacing them with plants using other energy sources and so install pollution control equipment,
- (e) utility steam distribution equipment, and
- (f) industrial heat recovery equipment.

This definition eliminates several categories of equipment that are eligible for the extra 10-percent credit under the Administration's proposal. The definition excludes property designed to save energy in

proposal. The definition excludes replacement property designed to save energy in an existing production process because this category would be extremely hard to define and such energy saving would already be encouraged by the tax on oil and gas used in industry.

Also, the definition excludes any property using coal or another fuel except where such property replaces oil and gas fired boilers, because there seems to be no reason to encourage the use of coal except insofar as it substitutes for the use of oil or gas.

The existing investment credit could be denied to new oil and gas fired boilers and electricity generators, and the existing investment credit also would be denied for portable air conditioners and space heaters and automobiles whose fuel economy is below the mandatory standards.

## VI. ACTION IN 94TH CONGRESS

### A. Investment credit provisions

#### *Insulation*

Under H.R. 6860, the investment credit would have been made available for insulation installed after March 17, 1975, and before January 1, 1978, if the costs were paid (or accrued) between those dates. The insulation was required to be installed in a structure existing on March 17, 1975, and which was used on that date in a trade or business.

Qualified insulation included regular insulation and storm (or thermal) windows and doors, and similar items, such as weatherstripping or caulking, designed specifically and primarily to reduce the heat gain or loss of a building. The material installed had to be new property, have a useful life (to that taxpayer) of at least three years, and meet performance standards that were to be prescribed in Treasury regulations. Insulation in buildings which furnish permanent lodging, such as hotels and apartments, would also have qualified for the credit.

The Senate Finance Committee adopted a similar provision in H.R. 6860 and in the energy title of the Tax Reform Act of 1976. The Finance Committee provisions extended the credit through the end of 1978.

#### *Solar energy equipment*

In H.R. 6860, the House would have made the investment credit available for the costs (including installation) of solar energy equipment installed on business or commercial property after March 17, 1975, and before January 1, 1981, where the equipment was used in a trade or business or as part of a facility for the production of income. To qualify for the credit, the taxpayer's cost for solar energy equipment was to have been paid or accrued before January 1, 1981. Also, the equipment had to be new in the hands of the taxpayer and had to have a useful life of at least three years. Unlike the investment credit for insulation, this credit would have been available not only for solar energy equipment installed in structures already in existence on March 17, 1975, but also for installations in new structures.

The investment credit under this provision would also have extended to solar energy equipment installed in business properties which furnish permanent lodging, such as apartments and hotels.

Solar energy equipment was defined as equipment which meets criteria established by the Secretary of Housing and Urban Development and which uses solar energy to heat or cool the building to which it is attached or to provide hot water for use within the building. The credit would not have been available, however, for back-up equipment which provides conventional heating or cooling during periods when the solar system is unable to function.

The House bill also contained a provision which allowed the costs of solar energy equipment to be amortized over a 60-month period. However, businesses were not permitted to claim both 5 year amortization and the full investment credit and an accelerated depreciation method, other than 5 year amortization, for the same solar energy equipment. A business could elect either the full investment credit or rapid amortization with two-thirds of the investment credit, but not both.

The Senate Finance Committee, in H.R. 6860 and in title XX of the Tax Reform Act of 1976, added a provision similar to that of the House bill, except that the amount of the credit was to be 20 percent of the cost of equipment paid for or accrued and put into use before 1982 and 10 percent of the cost of equipment placed in service after 1982 and before 1987. Exceptions from these time limitations were made in cases of certain binding contracts entered into within the applicable time limitation. There was no provision for electing rapid amortization instead of the credit.

The Finance Committee also made available an additional 2 percent credit for taxpayers who established or maintained an employee stock ownership plan (ESOP) to which the employer contributes stock equal in value to 2 percent of the qualified investment in solar equipment. Similar 2 percent additional credits were also provided in connection with the other energy credits under the Senate provisions, including the geothermal credit, the wind-related equipment credit and the credit for qualified energy conversion and conservation equipment, all discussed below.

A Senate floor amendment to the Tax Reform Act of 1976 would have terminated the 20 percent credit after 1979, and would have terminated the 10 percent credit after 1981.

#### *Geothermal equipment*

The House version of H.R. 6860 contained no provision dealing with this type of equipment. However, the Senate Finance Committee, in H.R. 6860 and in title XX of the Tax Reform Act of 1976, adopted a special investment credit for geothermal energy equipment installed on business or commercial property after December 31, 1976. The credit would have been available for equipment which became a structural component of a building and for equipment installed for business properties used predominantly to furnish lodging. The equipment eligible for the credit would have been that which uses geothermal energy to heat or cool a building or to heat water for it. Under a Senate floor amendment, the amount of the credit would have been 20 percent for equipment installed before 1980, and 10 percent for equipment installed in 1981 and 1982.

#### *Wind-related energy equipment*

The House version of H.R. 6860 contained no provision for wind-related energy equipment.

The Senate would have extended the investment credit to wind-related energy equipment (such as windmills) installed for use in the trade or business of producing electricity or to generate electricity for use in a trade or business. This provision was added as a Finance Committee floor amendment to the Tax Reform Act and later was included in H.R. 6860.

Under the Senate amendment, the amount of the credit was to be 20 percent of the cost of the qualified wind-related energy equipment installed after December 31, 1976, and before January 1, 1980, and 10 percent for equipment installed in 1980 and 1981.

*Denial of investment credit for portable air conditioners and heating units*

In H.R. 6860 the House would have denied the investment credit to portable and self-contained heating and air conditioning units, as is the case under present law for central heating and air conditioning units. This rule would have applied to all such units and would have been effective for such units placed in service after the date of enactment.

The Senate Finance Committee adopted a similar provision in title XX of the Tax Reform Act of 1976 and in H.R. 6860.

*Denial of investment credit for petroleum-powered electrical generators*

In H.R. 6860, the House would have repealed the investment credit for electrical generating equipment which uses oil or other petroleum products (including natural gas) as its fuel and which would be placed in service after April 17, 1975. However, a number of exceptions were provided (similar to those which have been made on suspension or termination of the investment credit in previous years) to deal with situations where the taxpayer before the effective date incurred substantial legal or economic obligations committing it to construction or acquisition of oil- or gas-fired electrical generating equipment. One exception was made for electrical generating equipment acquired, constructed, reconstructed, or erected pursuant to a contract which was binding on the taxpayer on and at all times after April 17, 1975. A second exception was made under the so-called plant facility rule for facilities under construction or largely paid for under a plan by April 17, 1975. A third exception was made for situations where the taxpayer had on hand on April 17, 1975, over 50 percent of the parts and components which would be assembled into an item of electrical generating property. A fourth exception was made for certain sale-leaseback transactions where a company which intended to use petroleum-fueled electrical generating equipment acquired it pursuant to a contract which was binding on it on April 17, 1975, but then sells the equipment to another person and leases back the use of the equipment.

The Senate Finance Committee deleted this provision from the bill.

**B. Amortization and other provisions**

*Qualified energy conversion and conservation equipment*

Under the House version of H.R. 6860, five types of conversion and conservation equipment were afforded special amortization treatment. The five types of equipment were:

- (1) Waste conversion equipment to use waste as a fuel, process waste into a fuel, sort and prepare waste for recycling, and recycling equipment.
- (2) Shale oil conversion equipment that is necessary to reach, extract and convert shale rock into raw shale oil.

(3) Coal slurry pipelines, including pipelines and equipment to transport coal over relatively long distances from the mine to another geographical area where the customer is located or where barges, rail lines, or other facilities for further shipment of the coal are located.

(4) Coal liquefaction and gasification equipment that can be used to process coal into the range of liquids and gases which can be derived from coal: low-Btu gas, high-Btu gas, solvent-refined coal, synthetic crude, crude oils and chemical feedstocks.

(5) Deep mining coal equipment needed to reach underground coal deposits in slope mines, shaft mines or drift mines and to extract the coal and bring it to the surface.

The House bill provided for 5-year amortization for the capital expenditures to acquire or to construct, reconstruct or erect qualified energy conversion and conservation equipment. Amortization of qualified property was to begin, at the taxpayer's election, either with the month following the month in which the property was placed in service or with the beginning of the taxable year immediately following the taxpayer's taxable year in which the property was placed in service. The investment to be amortized under this provision was the depreciated cost (adjusted basis) of the property, reflecting any depreciation allowed (or allowable) prior to the time when the 60-month period became effective. However, no deduction for the additional first-year depreciation allowance could be taken for qualified energy use property during a period in which the taxpayer would take rapid amortization deductions under this provision. The property also would have been eligible only for a two-thirds investment credit because the 5-year useful life would have had to be used for investment credit purposes.

The Senate Finance Committee in H.R. 6860 and in title XX of the Tax Reform Act of 1976, instead, made available 2 additional percentage points of investment credit for investment in qualified energy conversion and conservation equipment instead of rapid amortization. The additional credit was to be available for a 10-year period for all the equipment in this group except waste conversion equipment for which the added credit was to be available for 5 years. A Senate floor amendment reduced the time during which the credit was available to 3 years for waste conversion equipment, deep mining coal equipment and shale oil conversion equipment and to 5 years for coal liquefaction and gasification equipment. The additional credit for coal slurry pipelines were deleted from the bill on the Senate floor.

#### *Railroad provisions*

As part of the Tax Reform Act of 1976, Congress provided that railroads were to be permitted to expense replacement ties (other than those made of wood). Under prior law, the railroads had generally been required to capitalize such costs and write them off only when the track was replaced or retired. That Act also extended provisions permitting 50 year amortization of railway grading and tunnel bores to property placed in service before 1969. Under prior law, 50 year amortization was available for grading and tunnel bores placed in service after 1968, and the cost of older tunnel bores and grading could be written off only if the property was retired or abandoned.

Congress also modified the investment credit limitations with respect to railroads, so that railroads are entitled to apply investment credits against 100 percent of their tax liability for 1977 and 1978. Beginning in 1979, this limitation will be phased down 10 percentage points a year through 1983 to reach the same 50 percent limitation which applies to most other taxpayers.

In addition to the measures outlined above, Congress considered, but did not enact, provisions for the rapid amortization of railroad rolling stock. Under the tax law, railroad freight cars and locomotives placed in service after 1968 and before 1976 could, at the election of the taxpayer, be amortized on a straight line basis over 60 months. This provision was enacted for a 5-year period in the Tax Reform Act of 1969 and was extended in 1974 for one more year, through December 31, 1975. The investment credit was not allowed on property for which the 5-year amortization provisions had been elected.

The House version of H.R. 6860 provided a 5-year amortization period and a two-thirds investment credit for qualified railroad equipment placed in service after 1974 and before 1980. Qualified equipment included railroad rolling stock, classification yards, communications equipment, freight handling equipment, railroad ferries and leased unit coal trains.

The Senate Finance Committee, in H.R. 6860 and in the Tax Reform Act, adopted a provision which substituted a 12 percent investment credit for the railroad property incentives provided in the House bill. Railroad ferries were not eligible for the credit.

#### *Recycling credit*

A recycling tax credit was in the bill reported by the Ways and Means Committee as part of H.R. 6860, but was deleted from the bill by a floor amendment.

As reported by the committee, the bill contained a recycling tax credit aimed at encouraging recycling activity and investment in capital equipment used for recycling. The credit would accrue on the purchase of recyclable postconsumer solid waste materials<sup>4</sup> at the same rate as the credit for investment in personal property. The accrued credits could be applied against the recycler's tax liability, up to 15 percent of the cost of investment in recycling equipment placed in service, in addition to the 10-percent investment tax credit available generally to all business taxpayers. Credits on purchases of recyclable materials could be accrued through December 31, 1980, and applied to the cost of recycling equipment through December 31, 1983.

The credit on the purchase price would phase out if the price of the recyclable materials exceeded two times the base period price (adjusted for changes in the cost of living since the base period). No credits would be accrued if the purchase price became more than three times the adjusted base period price.<sup>5</sup> The phase out of the credit was included because higher prices provide sufficient incentive for suppliers, in contrast with periods of low prices.

<sup>4</sup> Defined as glass, paper, textiles, nonferrous metals (other than precious metals and other than copper base scrap), and ferrous metals.

<sup>5</sup> For these purposes, the base period price would have been the average of the appropriate prices during 1971 through 1973. The Bureau of Labor Statistics would establish the appropriate price index for each recyclable material, and it would adjust the base period price for changes in the cost of living. As the price of a recyclable material rises above 200 percent of the base period average, the credit earned on purchases would be reduced by an equal percentage. For example, if the index were 250, the credit would be reduced by 50 percent; if the index were 300, there would be no credit on such purchases.

When a taxpayer would apply these accrued credits against his tax liability, he could use them up to 15 percent of the purchase price of the equipment, which when added to the regular investment tax credit would provide a 25 percent tax credit. This 15 percent credit would be subject to the limitation relating to total tax liability, but not the limit to 50 percent of tax liability above the first \$25,000 under the regular investment tax credit.

In addition to the recycling credit, the House bill provided five-year amortization and eligibility for a two-thirds investment credit for equipment that may be used to sort and prepare solid waste for recycling or used for recycling solid waste.

The Finance Committee, in title XX of the Tax Reform Act of 1976, approved a recycling credit based on purchases of recycling materials above a base period level. The full Senate substituted and passed (as an amendment to a bill later enacted) a requirement for a six-month study of the need for recycling incentives to be prepared jointly by Treasury and EPA.

*Rapid amortization for pollution control equipment*

In the Tax Reform Act of 1969, five-year amortization was initially made available to a taxpayer at his election for pollution control equipment that was placed in service after 1968 in a plant or other property that was in existence before 1969. The election, after an extension, was available for equipment placed in service before January 1, 1976, at which time the provision expired. The provision was enacted as a special incentive for the installation of pollution control equipment in the Tax Reform Act of 1969, because that Act repealed the investment tax credit.

In the Tax Reform Act of 1976, the Congress restored five-year amortization for pollution control facilities as a permanent provision. The provision applies to a new identifiable, certified pollution control facility installed in a plant in operation before January 1, 1976. The Act amended the prior law definition, which limited the provision to equipment that controls the emission of pollutants, to include equipment that prevents the creation of pollutants. The provision was limited to equipment that would not significantly alter the costs of production or the level of output. In the Statement of Managers accompanying the conference report, significantly was defined to mean a change greater than 5 percent. In addition, the Act provided that a facility or equipment for which the taxpayer elects five-year amortization will be eligible for a one-half investment tax credit. The limited investment credit will not be allowed, however, if the useful life of the facility or equipment would be less than 5 years.

Restoration of the election for five-year amortization was effective with respect to certified pollution control equipment placed in service after December 31, 1975. The investment credit is generally available for such equipment placed in service after December 31, 1976.

## VII. AREAS FOR COMMITTEE CONSIDERATION

### A. General considerations

There are two main thrusts to the Administration's business tax credit proposals. First, the bill provides investment tax credit incentives for two types of alternative energy sources, coal and solar energy, in order to promote conversion from oil and natural gas energy sources. Second, the bill encourages conservation by providing investment credit incentives for cogeneration equipment and a group of other property placed in service to reduce energy consumption in buildings and industry. The investment credit is the only incentive provided under this part of the Administration proposal, and it utilizes positive incentives in every case, rather than disincentives (such as denial of a tax credit or a deduction) for investments which neither conserve energy in general nor reduce consumption of oil or natural gas.

Investment credits are a relatively efficient means of stimulating the type of energy activities which the Administration proposes to further through its proposal. However, in some circumstances disincentives such as taxes, the disallowance of existing credits or deductions, or even penalties, may be more effective and efficient means than tax credits for achieving a particular result. For example, the tax on the business use of oil should encourage industry to use less oil, if a business would switch to an alternative fuel only if the tax and the amount of oil needed even with conservation, raised costs sufficiently high to make the fuel change economic. In some cases, the energy costs of conversion may exceed the energy savings possible from conservation of oil use or the conversion to alternative fuels. Even if credits are desirable, parts of the Administration proposal need certain refinements.

#### *Issues in Administration proposal*

With regard to the generally applicable provisions of the Administration proposal, it should be noted that the levels of these credits are tied to the present law investment credit. It might be preferable if the committee created a separate category of energy investment credits, specifying the amount of credit which is to be available in each case, and provide that this credit will be in addition to any regular investment credit to which the property may also be entitled.

The Administration proposal does not make clear in which circumstance these energy tax credits are to be available. The provisions appear to be intended to apply to retrofit situations, that is, replacement of existing property or equipment with property or equipment which either conserves energy or utilizes an energy source other than oil or natural gas. This would include, for example, replacement of an oil-fired boiler with a coal-fired boiler. On the other hand, it would appear reasonable to extend the credits to certain situations where energy conservation property is added to an existing business property or indus-

trial process. For example, the incentive provided for conservation property would be substantially diluted if, for example, it was intended to apply only to replacement insulation or heat recovery devices rather than additions of insulation or these devices, since in many situations these types of property are not now in place. As a result, the committee may wish to specify in what circumstances the credits are to be available for the four categories of business energy property.

It is also not clear to what extent otherwise qualifying property would be eligible for the credit where the property provides increased productive capacity, for example, where an existing oil-fueled boiler is replaced with a coal-fueled boiler with significantly greater output. In the Tax Reform Act of 1976, Congress limited qualification for the investment tax credit to pollution control equipment which does not increase output or capacity or reduce costs by more than 5 percent.

The Administration bill does not specifically exclude electric utilities from eligibility for the business energy tax credit, but the Administration stated that it intended to do so. The committee may want to provide specific language to accomplish that purpose.

The limitation in the Administration's proposal that a qualifying investment in all cases be in connection with a building or structure raises the possibility that the incentive would be denied for energy conversion or conservation investments which are meritorious but are not related to a building or structure.

#### *Coverage of credit*

The committee may wish to examine the extent of coverage contained in these provisions. As already noted, investment tax credit incentives are provided to stimulate use of such alternative energy sources as coal, solar energy, waste materials and synthetic gas. There are a number of other alternative energy sources which appear to have greater potential in certain geographical areas and under some modes of use. For example, it has been indicated that there are sources of geothermal steam in about 25 States, chiefly along the Atlantic and Gulf Coast States and in the Western States, Alaska and Hawaii. Generally, verified geothermal deposits have been found suitable for commercial and industrial applications, which include steam generation of electricity, industrial process heat and other heating applications. In its present form, the bill provides tax credits that are limited to boilers that do not use oil, gas or their products as fuel, but it does not extend the credit to equipment associated with the use of other energy sources as boiler fuels or as heat or steam used in industry or business. Furthermore, wind, or a combination of wind and solar equipment, may be feasible energy alternatives for some parts of the country, including, at least during certain seasons, the Great Plains, New England and coastal areas. Such wind equipment appears to be most feasible for rural homes and farms.

The committee may wish to consider removing existing tax incentives in order to discourage energy consumption which is either inefficient or creates shortages of energy resources. For example, the House version of H.R. 6860 would have denied the investment credit for portable air conditioners and heating units and for electrical generating equipment which uses oil or natural gas as a fuel.

The Administration proposal does not address concerns that have been raised about the availability of transportation to carry increased coal production to points of use. The chief means of transporting coal are railroads, barges and coal slurry pipelines. Substantial investment will be necessary for the transportation equipment to carry coal, and probably other fuels. The committee may wish to consider transportation equipment in this context.

For example, the House version of H.R. 6860 provided 5-year amortization and a two-thirds investment credit for coal slurry pipelines and for certain railroad equipment including rolling stock, classification yards, communications equipment, freight handling equipment, railroad ferries and leased unit coal trains.

#### **B. Cogeneration**

At the outset, it should be pointed out that the potential savings of oil and gas are relatively small because cogenerated electricity will replace a utility's electricity which is, or will be, generated by coal. There are also several other questions with regard to the Administration's cogeneration proposal. First, there is considerable question whether limiting the availability of the incentive to additions to existing boiler facilities will negate the proposed incentive because of evidence that existing boiler facilities cannot be adapted to the generation of electricity.<sup>6</sup> As a result, it may be necessary to insure that the credit for cogeneration or alternative energy property will apply in this context to replacement boilers (using a fuel other than oil or gas) as well as to the turbines and other generating equipment in order to make this provision an effective alternative. More specificity is also needed as to the type of equipment which would qualify for the credit.

There are also regulatory and legal considerations which bear on the use of cogeneration techniques. The entry of industrial firms into cogeneration activities and the sale of electricity from cogeneration may subject these firms to the jurisdiction of Federal and State regulatory authorities, which could entail rate regulation, oversight of capital expenditures, assessment of service adequacy, and future service requirements among other matters. This prospect may not be considered attractive by potential cogenerators. One of the Administration's nontax proposals would authorize the FEA to exempt industrial cogenerators from Federal, State and local utility regulation.

#### **C. Alternative energy property**

The Administration's alternative energy category is basically a wide range of equipment involved in burning and handling coal at the point of use. This category of conversion property is closely related to the conversion rebates which the Administration proposes in connection with its industrial oil and gas users tax. As discussed in Pamphlet 11, there is considerable uncertainty about whether the rebates against the oil and gas users tax is an efficient way to encourage conversion activities. One alternative which the committee might wish

<sup>6</sup> Most existing industrial boilers generate steam under pressures up to 250 p.s.i. and temperatures up to 300° Fahrenheit. In order to generate electricity effectively, however, steam pressures of over 400 p.s.i. and temperatures of 450° are ordinarily necessary.

to consider would be to make the investment tax credit the only tax incentive for conversion.

This approach would require modifying the Administration proposal. The simplest modification would be to eliminate the termination date of December 31, 1982.<sup>7</sup> Another modification would be to make the credit available to the installation of these types of equipment in both new and old structures, buildings and facilities.

The language in the administration bill (H.R. 6831) does not make it clear that electric utilities are not to be entitled to elect the business energy credit for alternative energy property. The committee may wish to clarify this question.

It is also noted that list of items included as qualifying property for the credit under this provision differs from the list of alternative energy property specified under the oil and natural gas consumption tax-rebate provision. Since industrial taxpayers are provided an election to use either the rebate or these investment credits, the committee could consider whether the list of qualifying property should be uniform in these two provisions.

It is also not clear whether an investment in alternative energy equipment must replace only equipment which uses oil or natural gas. In addition to dealing with the questions raised earlier concerning specifications for business energy credit property in general, the committee may wish to consider whether qualifying alternative energy property should include replacement property for existing property which does not have oil or natural gas as its resource fuel. For example, the credit would appear to be available under the proposal where a coal-fired boiler is installed to replace either electric power purchased from a utility (which is or will be also generated by coal) or an old coal-fired boiler.

In addition, the Committee may wish to consider making the credit available for any equipment which utilizes another fuel in combination with oil. For example, the Committee may want to make the credit available for equipment which enables an existing oil or gas burning facility to convert to an oil and coal fuel mixture. This type of interim measure appears to be necessary to encourage at least some conversion to coal by oil and gas facilities that have been installed in recent years. Such facilities are capable of burning about 25 percent coal in an oil mixture, and the cost of converting to this type of fuel is significantly less than replacing an entire existing system. In some industries, various types of waste may be used with oil, leading to substantial oil savings.

Another possibility which the committee might wish to consider would be to provide a substantial credit, possibly higher than the 20 percent recommended by the Administration, for conversion expenditures which occur in the near future. This credit could gradually be phased down so that expenditures in later years would receive progressively less credit. This would have the effect of encouraging conversion as rapidly as possible.

<sup>7</sup>The planning, design and installation of replacement coal boilers may take as much as eight years, particularly for large industrial or utility boilers.

Finally, the committee might also wish to consider the circumstances under which pollution control equipment would qualify for an additional investment credit as alternative energy property. Eligibility for the credit based on regulations other than those of the Federal Government could in some circumstances provide too easy access to this incentive and the committee may wish to consider substituting qualification standards which exist for pollution control equipment under present tax law.

#### **D. Solar energy equipment**

As is the case with the Administration's alternative energy category, it may be necessary to extend the effective date for the credit for solar energy equipment. In addition, it could be provided, for both conversion property categories, that the percentage rate of the new or addition credit declines in later years.

#### **E. Conservation property**

Under the Administration proposal, this category covers insulation and a number of waste heat or gas recovery devices. The provision is interpreted to apply only to retrofit property, that is property or equipment added to existing business equipment or a process in order to reduce heat or energy consumption.

This interpretation would, as a result, exclude replacements of existing property with more efficient property, the installation of which the committee may wish to encourage. For example, the replacement of a conventional electric motor with a more efficient motor would fail to qualify. However, the retrofit interpretation of this provision enables the determination of qualifying property to be made by function, which is much easier to apply than the highly subjective relative energy efficiency test which would be necessary if replacements were included under the Administration proposal. If the committee wishes to include replacement property in this category, it is necessary to provide objective standards to assist the Secretary in the determination of what is qualifying property. Such standards would still have considerable subjectivity, but they could specify a minimum percentage reduction in energy consumption that would be related to the point in the useful life of the old property at which it is replaced.

