INDUSTRIAL ENERGY EFFICIENCY AND FUEL CONVERSION TAX INCENTIVE ACT

HEARING

BEFORE THE

SUBCOMMITTEE ON TAXATION AND DEBT MANAGEMENT GENERALLY

OF THE

COMMITTEE ON FINANCE

UNITED STATES SENATE

NINETY-SIXTH CONGRESS

SECOND SESSION

ON

S. 3006

SEPTEMBER 29, 1980

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INDUSTRIAL ENERGY EFFICIENCY AND FUEL CONVERSION TAX INCENTIVE ACT

MONDAY, SEPTEMBER 29, 1980

U.S. SENATE,
SUBCOMMITEE ON TAXATION AND DEBT MANAGEMENT,
COMMITTEE ON FINANCE,
Washington, D.C.

The subcommittee met at 10 a.m., in room 2221, Dirksen Senate Office Building, Senator Harry F. Byrd, Jr. (chairman of the subcommittee) presiding.

Present: Senators Byrd, Bentsen, Bradley, and Wallop.

[The press release announcing these hearings, the bill S. 3006, and the memorandum from the Joint Committee on Taxation follow:]

Press Release #H-56

P R E S S R E L E A S E

FOR IMMEDIATE RELEASE
September 18, 1980

COMMITTEE ON FINANCE
UNITED STATES SENATE
Subcommittee on Taxation and
Debt Management
2227 Dirksen Senate Office Bldg.

FINANCE SUBCOMMITTEE ON TAXATION AND DEBT MANAGEMENT SETS HEARING ON S. 3006, THE INDUSTRIAL ENERGY AND EFFICIENCY FUEL CONVERSION TAX INCENTIVE ACT OF 1980

Senator Harry F. Byrd, Jr., Chairman of the Subcommittee on Taxation and Debt Management of the Senate Committee on Finance, announced today that the Subcommittee will hold a hearing on Monday, September 29, 1980, on S. 3006, The Industrial Energy Efficiency and Fuel Conversion Tax Incentive Act of 1980, introduced by Senator Wallop.

The hearing will begin at 10:00 a.m. in Room 6226 of the Dirksen Senate Office Building.

Senator Wallop stated, "Industrial energy conservation entails costly investments in new equipment and modifications in existing plants to allow more efficient, productive use of our energy resources. Although it demands costly investments, industrial conservation can create significant short-term response to our energy problems."

Witnesses who desire to testify at the hearing must submit a written request, including a mailing address and phone number, to Michael Stern, Staff Director, Committee on Finance, Room 2227 Dirksen Senate Office Building, Washington, D.C. 20510, by no later than the close of business on September 24, 1980.

Consolidated Testimony. -- Senator Byrd also stated that the Committee urges all witnesses who have a common position or the same general interest to consolidate their testimony and designate a single spokesman to present their common viewpoint orally to the Committee. This procedure will enable the Committee to receive a wider expression of views than it might otherwise obtain.

Legislative Reorganization Act.-- Senator Byrd stated that the Legislative Reorganization Act of 1946, as amended, requires all witnesses appearing before the Committees of Congress "to file in advance written statements of their proposed testimony, and to limit their oral presentations to brief summaries of their argument."

Witnesses scheduled to testify should comply with the following rules:

(1) All witnesses must include with their written statements a one-page summary of the principal points included in the statement.

(2) The written statements must be typed on letter-size (not legal size) paper and at least 100 copies must be delivered to Room 2227, Dirksen Senate Office Building, not later than noon of the last business day before the witness is scheduled to appear.

(3) Witnesses are not to read their written statements to the Subcommittee, but are to confine their oral presentations to a summary of the points included in the statement.

Written Statements. -- Witnesses who are not scheduled to make an oral presentation, and others who desire to present their views to the Subcommittee, are urged to prepare a written statement for submission and inclusion in the printed record of the hearing. These written statements should be typewritten, not more than 25 double-spaced pages in length, and mailed with five (5) copies to Michael Stern, Staff Director, Committee on Finance, Room 2227, Dirksen Senate Office Building, Washington, D.C. 20510, not later than October 27, 1980.

II

96TH CONGRESS
2D SESSION

S. 3006

To amend the Internal Revenue Code of 1954 to provide a nonrefundable tax credit for investment in qualified industrial energy efficiency and fuel conversion projects.

IN THE SENATE OF THE UNITED STATES

AUGUST 1 (legislative day, JUNE 12), 1980

Mr. WALLOP introduced the following bill; which was read twice and referred to the Committee on Finance

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A BILL

To amend the Internal Revenue Code of 1954 to provide a nonrefundable tax credit for investment in qualified industrial energy efficiency and fuel conversion projects.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Industrial Energy Efficiency and Fuel Conversion Tax Incentive Act of 1980".

SEC. 2. ALLOWANCE OF CREDIT.

(a) IN GENERAL.—Subpart A of part IV of subchapter A of chapter 1 of the Internal Revenue Code of 1954 (relat-

ing to credits against tax) is amended by inserting after section 44E the following new section:

"SEC. 44F. INVESTMENT IN QUALIFIED INDUSTRIAL ENERGY EFFICIENCY AND FUEL CONVERSION PROJECTS.

"(a) GENERAL RULE.—There is allowed as a credit against the tax imposed by this chapter for the taxable year an amount equal to 20 percent of the qualified investment (as determined under section 46 (c) and (d)) in section 38 property (determined without regard to the words '(not including a building or its structural components)' in section 48(a)(1)(B)) which is (or, for the purpose of applying section 46(d), will be) qualified industrial energy property.

"(b) CREDIT NOT TO EXCEED TAX LIABILITY.—

"(1) APPLICATION WITH OTHER CREDITS.—The credit allowed by subsection (a) shall not exceed the tax imposed by this chapter for the taxable year, reduced by the sum of the credits allowable under a section of this part having a lower number or letter designation than this section other than the credits allowable by sections 31, 39, and 43.

"(2) CERTAIN TAXES NOT CONSIDERED TAXES IMPOSED BY THIS CHAPTER.—For purposes of this section, any tax imposed for the taxable year by section 55 (relating to alternative minimum tax for taxpayers other than corporations), section 56 (relating to

minimum tax for tax preferences), section 72(m)(5)(B) (relating to 10 percent tax on premature distributions to owner-employees), section 402(e) (relating to tax on lump-sum distributions), section 408(f) (relating to additional tax on income from certain retirement accounts), section 409(c) (relating to additional tax on retirement bonds), section 531 (relating to accumulated earnings tax), section 541 (relating to personal holding company tax), or section 1378 (relating to tax on certain capital gains of subchapter S corporations), and any additional tax imposed for the taxable year by section 1351(b)(1) (relating to recoveries of foreign expropriation losses), shall not be considered tax imposed by this chapter for such year.

"(3) CARRYBACK AND CARRYOVER OF UNUSED CREDIT.—

"(A) IN GENERAL.—If the amount of the credit determined under subsection (a) for any taxable year exceeds the limitation provided by paragraph (1) for such taxable year (referred to elsewhere in this section as the 'unused credit year'), the excess shall be—

"(i) an industrial energy conservation investment tax credit carryback to each of

the 3 taxable years preceding the unused credit year, and

"(ii) an industrial energy conservation investment tax credit carryover to the following year following the unused credit year,

and, subject to the limitations imposed by paragraph (1), shall be added to the amount allowable as a credit by such section for such years. The entire amount of the unused credit year for an unused credit shall be carried to the earliest of the 4 taxable years to which (by reason of clauses (i) and (ii) it may be carried, and then to each of the other 3 years to which it may be carried to the extent that, because of the limitation in subparagraph (B), the unused credit may not be added for a prior taxable year.

"(B) LIMITATION.—The amount of the unused credit which may be added under subparagraph (A) for any preceding or succeeding taxable year shall not exceed the amount by which the limitation provided by paragraph (1) for such taxable year exceeds the sum of—

"(i) the credit allowable under this section (determined without regard to this paragraph) for the taxable year, and

"(ii) the amounts which, by reason of this paragraph, are added to the amount allowable for the taxable year and which are attributable to taxable years preceding the unused credit year.

"(c) QUALIFIED INDUSTRIAL ENERGY PROPERTY.—

"(1) IN GENERAL.—For purposes of this section, the term 'qualified industrial energy property' means property used as an integral part of a modification to, or replacement of, all or part of an existing manufacturing, production, or extraction facility, commercial or industrial process, or item of equipment, but only if such modification or replacement—

"(A) does not increase the total amount of oil and natural gas (other than petroleum coke and waste gases) consumed by such facility, process, or item of equipment per unit of output, and

"(B) either results in—

"(i) the utilization by such facility, process, or item of equipment of less energy per unit of output, or

"(ii) the conversion of such facility, process, or item of equipment to permit the use of an alternate substance as a fuel or feedstock.

"(2) LIMITATIONS.—Property shall be considered as qualified industrial energy property only if such property is tangible property—

"(A) used as an integral part of manufacturing production, or extraction,

"(B) with respect to which depreciation (or amortization in lieu of depreciation) is allowable,

"(C) the useful life of which (determined as of the time such property is placed in service) is 3 years or more,

"(D) the original use of which commences with the taxpayer, and

"(E) either directly results in a utilization or conversion described in paragraph (1)(B), or is—

"(i) part of,

"(ii) physically attached to, or

"(iii) directly associated with or functionally related to,

such property.

Property the installation of which is reasonably necessary for the proper installation, operation, or maintenance of property which directly results in a utilization or conversion described in paragraph (1)(B) shall be treated as property described in subparagraph (E)(iii).

"(3) EXISTING.—The term 'existing' means—

"(A) when used in connection with a facility, a facility, the construction, reconstruction, or erection of which is completed before December 31, 1980,

"(B) when used in connection with an industrial or commercial process, a process which was carried on as of such date, and

"(C) when used in connection with equipment, equipment which was placed in service before such date.

"(4) ALTERNATE SUBSTANCE.—The term 'alternate substance' means any substance other than—

"(A) oil,

"(B) natural gas, or

"(C) any product (other than petroleum coke and waste gases) of oil or natural gas.

"(5) COMPUTATIONS PER UNIT OF OUTPUT.—The determination required by paragraph (1)(A), and, if applicable, the determination required by paragraph (1)(B)(i), shall be made by comparing the Btu content of the oil and gas (or other source of energy in the case of paragraph (1)(B)(i)) used by the facility, commercial or industrial process, or item of equipment per unit of output prior to the modification or replacement, with the Btu content of the oil and natural gas (or

other source of energy in the case of paragraph (1)(B)(i)) used by such facility, commercial or industrial process or item of equipment per unit of output upon completion of the modification or replacement. Computations under this subparagraph shall be made in accordance with subsection (d).

"(d) REDUCTION OF CREDIT.—

"(1) IN GENERAL.—Notwithstanding subsection (a), the credit allowable by this section for qualified industrial energy property shall not exceed the amount determined under the following table:

"If the BOE cost of the property is—	The allowable credit is—
Less than $11	Zero.
At least $11 but not more than $55	The subsection (a) amount.
More than $55	The alternative credit amount.

"(2) DEFINITIONS.—For purposes of paragraph (1)—

"(A) BOE COST.—The term 'BOE cost' means, with respect to any qualified industrial energy property—

"(i) the subsection (a) amount with respect to such property, divided by—

"(ii) the annual number of BOE's saved by the modification or replacement of which such property is an integral part.

"(B) ANNUAL BOE'S SAVED.—The term 'annual number of BOE's saved' means an amount equal to—

"(i) the excess of—

"(I) the average number of BOE's utilized by the facility, commercial or industrial process, or item of equipment per unit of output during a representative 12-month period prior to the modification or replacement, over

"(II) the number of BOE's utilized by such facility, commercial or industrial process, or item of equipment per unit of output during any representative 12-month period occurring within the recomputation period,

multiplied by—

"(ii) the units of output during such 12-month period prior to the modification of replacement.

For purposes of this subparagraph, one BOE shall be equal to 5.8 million Btu's, and determinations with respect to electricity shall be made by employing a heat rate of 10,000 Btu's per kilowatt hour.

"(C) SUBSECTION (a) AMOUNT.—The term 'subsection (a) amount' means the credit allowable under this section determined without regard to this subsection.

"(D) ALTERNATIVE CREDIT AMOUNT.—The term 'alternative credit amount' means, with respect to any qualified industrial energy property, an amount equal to $55 multiplied by the annual number of BOE's saved by the modification or replacement of which such property is an integral part.

"(3) TIME OF APPLICATION OF LIMITATIONS ON AMOUNT OF CREDIT.—

"(A) IN GENERAL.—The provisions of this subsection shall be applied as of the close of the recomputation period.

"(B) RECOMPUTATION PERIOD DEFINED.—For purposes of this paragraph, the term 'recomputation period' means, with respect to any modification or replacement, the period which begins on the date on which the qualified industrial energy property which is an integral part of such modification or replacement is placed in service and ends on the last day of the first taxable year beginning more than 180 days after such date.

"(C) RECAPTURE OF EXCESS CREDIT.—If the amount of the credit allowed under this section (determined without regard to this subsection) with respect to qualified industrial energy conservation property exceeds the credit allowable under this subsection, the tax imposed by this chapter for the recomputation year shall be increased under section 47 by the amount of such excess.

"(d) SPECIAL RULES.—

"(1) CERTAIN OTHERWISE QUALIFIED PROPERTY NOT TO BE TREATED AS QUALIFIED.—No property shall be treated as qualified industrial energy property if—

"(A) the taxpayer claims the energy percentage provided by section 46(a)(2)(C) with respect to that property, or

"(B) in the case of property which replaces an existing productive facility—

"(i) the replaced property is not retired from service, other than for use as a temporary replacement for the qualified industrial energy property which replaced it during periods for which the qualified property is inoperable due to an emergency or on account of repairs or maintenance, or

"(ii) the replacement property is constructed on a site other than the site of the replaced property or reasonably adjacent to that site.

"(2) APPLICATION OF INVESTMENT CREDIT RULES.—

"(A) CREDIT IN ADDITION TO SECTION 38 CREDIT.—The credit allowed by this section is in addition to any amount allowed as a credit under section 38 (other than any amount determined under section 46(a)(2)(C) (relating to the energy percentage)).

"(B) CERTAIN SUBPART B RULES TO APPLY.—

"(i) Except as otherwise provided in this section, the provisions of sections 47 and 48 are hereby made applicable, under regulations prescribed by the Secretary, to the credit allowed by this section, except that—

"(I) the words '(not including a building and its structural components)' contained in section 48(a)(1)(B) shall be disregarded,

"(II) any reference to 'section 38 property' shall be treated as a reference

to 'qualified industrial energy property', and

"(III) section 48(a)(10) (relating to boilers fueled by oil or gas) shall not apply.

"(ii) For the purpose of determining the amount of the taxpayer's qualified investment in qualified industrial energy property, the applicable percentage (for purposes of section 46(c)(1)) shall be 100 percent for all items without regard to the useful life of any particular item.

"(iii) For purposes of applying section 47, if qualified industrial energy property is disposed of or converted into property which is not qualified industrial energy property, and if such disposition or conversion occurs before it has been in service for half its useful life, the disposition or conversion shall be treated as having occurred before the close of the third year after the property was placed in service.

"(iv) No credit shall be allowed under this section for property which is public util-

ity property (within the meaning of section 46(f)(5)).

"(v) In the case of a taxpayer which is not a corporation, the credit allowed by subsection (a) shall be allowed with respect to property of which such person is the lessor under the rules applicable to the credit allowed by section 38 set forth in section 46(e)(3) (but without regard to the limitations of section 48(a) (4) and (5)).

"(3) PROPERTY FINANCED BY PUBLIC FUNDS.—Any investment in qualified industrial energy property shall be reduced to the extent that such investment is made directly or indirectly with funds provided for the acquisition or modification of such property by a grant paid by any agency of the United States.

"(4) PROPERTY FINANCED BY INDUSTRIAL DEVELOPMENT BONDS.—In the case of qualified industrial energy property which is financed in whole or in part by the proceeds of an industrial development bond (within the meaning of section 103(b)(2)) the interest on which is exempt from tax under section 103, '10 percent' shall be substituted for '20 percent' in subsection (a).".

(b) TECHNICAL AND CONFORMING AMENDMENTS.—

(1) The table of sections for such subpart A is amended by inserting after the item relating to section 44E the following new item:

"Sec. 44F. Investment in qualified industrial energy efficiency and fuel conservation projects.".

(2) Paragraph (8) of section 46(f) of such Code is amended by striking out "and the Revenue Act of 1978" and inserting in lieu thereof "the Revenue Act of 1978, and the Industrial Energy Efficiency and Fuel Conversion Tax Incentive Act of 1980".

(3) Section 6096(b) of such Code (relating to designation of income tax payment to Presidential Election Campaign Fund) is amended by striking out "and 44E", and inserting in lieu thereof "44E, and 44F".

(c) EFFECTIVE DATE.—

(1) IN GENERAL.—The amendments made by this section shall apply to qualified industrial energy property which is placed in service not later than December 31, 1986, and

(A) which is acquired by the taxpayer after July 31, 1980, or

(B) the construction, reconstruction, or erection of which is commenced by the taxpayer after July 31, 1980.

(2) AFFIRMATIVE COMMITMENTS.—For the purpose of applying the provisions of paragraph (1) with

respect to property which is part of a project with a normal construction period of two years or more (within the meaning of section 46(d)(2)(A)(i) of the Internal Revenue Code of 1954), "December 31, 1994" shall be substituted for "December 31, 1986" if—

(A) before January 1, 1987, the taxpayer has completed all engineering studies in connection with the commencement of the construction project, and has applied for all environmental and construction permits required under Federal, State, or local law in connection with the commencement of the construction of the project, and

(B) before January 1, 1990, the taxpayer has entered into binding contracts for the acquisition, construction, reconstruction, or erection of equipment specially defined for the project and the aggregate cost to the taxpayer of that equipment is at least 50 percent of the reasonably estimated cost for all such equipment which is to be placed in service as part of the project upon its completion.

SEC. 3. INCREASED CREDIT FOR CERTAIN ITEMS OF ALTERNATIVE ENERGY PROPERTY AND SPECIALLY DEFINED ENERGY PROPERTY.

(a) IN GENERAL.—The table contained in clause (i) of section 46(a)(2)(C) of the Internal Revenue Code of 1954 (relating to energy percentage) is amended by adding at the end thereof the following new subclause:

"VII. CERTAIN ALTERNATIVE ENERGY PROPERTY AND SPECIALLY DEFINED ENERGY PROPERTY.—Property described in section 48(l)(2)(A)(iv), 48(l)(3) (other than clause (viii) or (ix) of subparagraph (A) thereof), or 48(l)(5).	20 percent ..	The date of the enactment of the Industrial Energy Efficiency and Fuel Conversion Tax Incentive Act of 1980.	December 31, 1986.".

(b) EFFECTIVE DATE.—The amendment made by this section shall apply to taxable years ending on or after the date of enactment of this Act.

O

Joint Committee on Taxation
September 25, 1980
JCX-51-80

S. 3006--Industrial Energy Efficiency and Fuel Conversion Tax Incentive Act of 1980

Present law

The Energy Tax Act of 1978 provided a 10-percent nonrefundable energy tax credit, through December 31, 1982, for specified items of energy conservation property that are used to increase energy efficiency or to reduce the amount of energy consumed in existing processes at existing facilities. The items which specifically were made eligible for the credit include, among others, recuperators, heat wheels, heat exchangers and automatic energy control systems. The Secretary is authorized to specify additional items of qualifying property. That authority has not yet been exercised, and in 1980 Congress added standards that the Secretary must use in exercising the authority to add items to the list.

Alternative energy property was made eligible for a 10-percent nonrefundable energy credit for replacement boilers and burners that use an alternate substance, i.e., oil, natural gas, or one of their products, and equipment that employs an alternate substance to make a synthetic liquid, gaseous or solid fuel, a feedstock and related handling and pollution control equipment. This credit also expires after December 31, 1982, but for taxpayers with projects that require substantial planning and production periods, the expiration date is waived if certain, specified affirmative commitments have been made in a timely fashion.

Recycling equipment also is eligible for the energy investment credit at a 10-percent rate.

These credits are not available for public utility property. In situations when an industrial development bond has been used to finance acquisition of qualified energy property, half of the energy credit will be allowable. Rules to prevent the use of Federal tax or other incentives for energy purposes were enacted as part of the Windfall Profit Tax bill.

Explanation of provision

The bill would increase the energy investment credit to 20 percent for alternative energy property (except geothermal and ocean thermal property), specially defined energy property and recycling equipment as defined in section 48(l) of the Code. The bill also creates a new category of investment property, called Qualified Industrial Energy Property (QIEP), which will be eligible for a 20-percent investment credit.

QIEP must be an integral part of a modification to, or replacement of, all or part of an existing manufacturing, production or extraction facility, commercial or industrial process, or item of equipment. The modification or replacement must not increase the total amount of natural gas or oil (other than waste gases and petroleum coke) consumed by the facility, process or equipment per unit of output, and the QIEP must result in the use of less energy per unit of output by the facility, process or equipment, or in conversion to the use of an alternate substance or feedstock.

The availability of the credit also is dependent upon the amount of energy saving produced by the QIEP. There is a threshold below which no credit would be allowable. If the energy saving is less than $11 per barrel of oil equivalent (BOE), there would be no credit. When the energy saving is more than $55 per BOE, the credit amount would be $55 multiplied by the amount of saving. From $11 through $55 BOE, the 20-percent energy investment credit would apply.

The QIEP credit could not exceed tax liability and would be subject to a 3-year carryback and 4-year carryforward. In each year in which a credit is available, it may be applied against the excess of tax liability over other tax credits from other Code sections (see below) by applying QIEP credits earned in the current year first and then by applying carryover credits, starting with such credits from the earliest carryover year. These credits would be computed after taking into account the credits for tax withheld at the source on nonresident aliens and foriegn corporations (sec. 32), the credit for taxes on foreign countries and possessions (sec. 33), the credit for the elderly (sec. 37), the credit for expenses of work incentive programs (sec. 40), the credit for political contributions (sec. 41), the credit for dependent care expenses (sec. 44A), the credit for employment of new employees (sec. 44B), and the credit for residential energy expenditures (sec. 44C). Certain penalty and surtaxes, including the minimum taxes on tax preferences, the tax on premature distributions from H.R. 10 plans, the tax on lump-sum pension plan distributions, and others, are disregarded in computing the limitation on the amount of the credit.

Qualified property must be new tangible property for which depreciation is allowable, have a useful life of 3 or more years and be directly related and utilized for energy reduction or conversion. Qualified property must be installed in or connection with an existing facility. Existing can mean a facility that was completed before December 31, 1980, an industrial or commercial process carried on as of December 31, 1980, and an item of equipment placed in service before December 31, 1980.

No property is eligible for the QIEP credit, if the regular investment credit is claimed, or if the replaced property is not retired (except for standby use) or the replacement is not on the same or an adjacent site.

The rules governing eligibility for the regular investment credit would apply with a few modifications. The exclusion of a building and its structural components would be disregarded. Boilers fueled by oil or gas would be eligible for QIEP, notwithstanding their ineligibility under the regular credit. There would be no partial credits; all qualified property with a useful life of 3 or more years would receive the QIEP credit.

Public utility property would not be eligible. Basis would be reduced by the direct or indirect use of grant funds from the United States. The credit rate would be halved if proceeds from the issue of an industrial development bond are used in whole or in part to finance acquisition of QIEP.

The affirmative commitment rule enacted in the Windfall Profit Excise Tax Act of 1980 also would apply with later date limitations.

Effective date

The amendments with respect to QIEP would apply for property placed in service before January 1, 1987, and which would have been acquired by the taxpayer, or for which construction, reconstruction or erection would have begun after July 31, 1980.

For QIEP to which the affirmative commitment rule would apply, the credit would apply to property placed in service before January 1, 1995.

The amendment to increase the energy investment tax credit to 20 percent for alternative energy property, specially defined energy property and recycling equipment would apply to taxable years ending on or after the date of enactment.

Senator BYRD. The hour of 10 o'clock having arrived, the committee will come to order.

The subcommittee today will consider S. 3006, the Energy Industrial Efficiency and Conversion Tax Incentive Act of 1980. This measure is sponsored by Senators Wallop, Simpson, Domenici, and Riegle. I commend these Senators for their interest in measures to promote energy conservation in the private sector. The subcommittee shall give careful attention to this legislation and the comments which the witnesses will make today.

Having stated that as chairman of the subcommittee, I want to state as a member of the subcommittee that this legislation would increase the investment tax credit from 10-percent to 20 percent and as an individual Senator I have some concern about going beyond 10 percent. I think a 10-percent investment tax credit is a very substantial tax credit. However, I shall keep an open mind on the legislation and will now call on the first witness, the Honorable Emil Sunley, Deputy Assistant Secretary, Tax Analysis, U.S. Department of the Treasury. I might say at this point that I have another commitment regarding matters on the floor of the Senate at the moment and I may not be able to be here for this entire hearing.

Let me ask you, Mr. Sunley, are you testifying for or against this legislation?

STATEMENT OF HON. EMIL M. SUNLEY, DEPUTY ASSISTANT SECRETARY OF THE TREASURY—TAX POLICY

Mr. SUNLEY. There is considerable sympathy, Mr. Chairman, for the concept of S. 3008 and considerable doubt in terms of whether it can be actually administered and made to work.

Senator BYRD. Doubt as to whether it can be administered and made to work?

Mr. SUNLEY. Yes. What Senator Wallop has done in S. 3006 is to try to limit the energy tax credit to those situations where you can demonstrate energy savings per unit of output. If the energy savings are very high, no subsidy is provided. Presumably the investor would make those investments without additional subsidy. Where the energy savings are very low, a very limited subsidy is provided. But it does require that you measure things like energy savings per unit of output and that causes us considerable difficulty.

Senator BYRD. You may proceed as you wish.

Mr. SUNLEY. Thank you Mr. Chairman.

I welcome this opportunity to present the views of the Department of the Treasury on S. 3006, the Industrial Energy Efficiency and Fuel Conversion Tax Incentive Act of 1980.

The objective of the bill is to reduce consumption of oil and natural gas by encouraging industry to adopt methods of production which are more energy efficient or which use alternative fuels. The continuing hostilities between Iraq and Iran are a vivid reminder of the uncertainties associated with the continued heavy dependence of the United States on imported oil as a source of energy. It must also be noted, however, that three recent developments are having a significant impact on overall energy consumption, and in particular on imported oil. First, the long delayed but necessary step of decontrolling domestic oil prices was begun.

When controls are fully phased out in October 1981, domestic oil will be priced at the same level as imported oil, rather than an artificially lower price. Underpricing domestic oil has been a major contributing factor to the underevaluation of energy conservation and conversion projects in the past; decontrol will remove this distortion. Second, increases in the world price of oil, particularly the very rapid increases since the beginning of 1979, provide a very strong, direct incentive to use energy efficiently. Third, incentives for energy conservation and conversion over and above the market price incentives have been provided by the Congress in the form of special energy tax credits. The Energy Tax Act of 1978 contained provisions, broadened by the Crude Oil Windfall Profit Tax Act of 1980, that generally allow an additional 10-percent investment credit for eligible energy property.

While it is undoubtedly too early to assess the full impact of decontrol, recent world oil price increases, and the energy tax credits, we can see in the aggregate statistics some very encouraging signs and trends. Since 1977, the peak year, U.S. imports of petroleum products have dropped from 8.54 million barrels per day to 7.87 million barrels per day in 1979, a decline of 7.8 percent. There will be a substantial reduction in 1980 compared to 1979. The amount of energy necessary to produce $1 of real GNP is also declining: From 59,700 Btu's in 1974 to 55,100 Btu's in 1979, a decline of 7.7 percent. These figures suggest that while we still have a long way to go, we have made very real progress. And, there is every reason to expect significant additional progress as the effects of higher oil prices and energy credits are reflected in consumption and production patterns. It is against this background that S. 3006 must be judged.

Generally the bill would allow, subject to certain restrictions and limitations, a 20-percent investment tax credit for investment in "qualified industrial energy property." To qualify, a property must modify or replace an existing facility, process or item of equipment, must not increase the amount of oil and natural gas consumed per unit of output, and must either reduce energy consumption per unit of output or permit conversion to an alternative fuel or feedstock. Further, the credit would only apply if there were actual energy savings and would be reduced in some cases depending on the cost of the property relative to the energy savings.

Without going further into the specific provisions of the bill, I would like to draw your attention to what I consider its very positive aspects. Its general goal of reducing consumption of oil and natural gas has been a central element of the administration's energy program, and alternative methods of achieving that goal must be explored so long as the energy crisis persists. The bill seeks to focus the credit on investment that might not otherwise be undertaken by attempting to allow the credit only where there is an actual reduction in energy consumption per unit of output and by giving taxpayers fairly broad discretion over the mix of investment properties used to achieve energy savings. The remainder of my testimony will address the fact that these quite laudable objectives are not successfully translated into rules that are both administerable and avoid adverse incentives.

Whether the bill would successfully meet its objectives depends fundamentally on whether the credit it provides offers the proper incentives to use energy efficiently and to convert to alternative energy sources.

One objective of the bill is to attempt to focus the credit on investments that might not otherwise be undertaken. The focusing mechanism is a reduction in the otherwise allowable credit, determined as follows: The annual number of BOE's—barrel of oil equivalents—saved is computed by taking the difference between the BOE's per unit of output in the preinvestment period and the BOE's per unit of output in the postinvestment period and multiplying that difference by the number of units of output in the preinvestment period. The otherwise allowable credit—that is, 20 percent of the cost of the "qualified industrial energy property"—is then divided by the annual number of BOE's saved as computed above; the result is termed the "BOE cost" of the property. If the BOE cost of the property is less than $11, the credit is reduced to zero. If the BOE cost of the property is between $11 and $55, the credit is not reduced—that is, the full 20 percent is allowed. Finally, if the BOE cost exceeds $55, the credit is reduced to $55 per BOE saved.

The bill thus divides BOE costs into three ranges that are presumed to reflect differences in the amount of incentive required to produce cost effective energy savings. In the first range, covering investments with BOE costs of under $11, a relatively large amount of energy is saved per dollar of investment, and it is assumed that such investments would therefore be undertaken without credit. In the intermediate range of BOE costs between $11 and $55, it is assumed that the full 20-percent credit is necessary to induce the investment, and that the full credit is cost effective. At a BOE cost above $55, little energy is saved per dollar of investment; it is assumed that investments in this top range require some incentive, but that the incentive is only cost effective at a level of $55 per BOE saved. It is not clear how these ranges were determined, nor whether they are appropriate for their presumed objectives.

One important element of this credit, which is different from all other investment tax credits, is that at the time an investment is made there is no assurance that the investment will in fact qualify for the credit. Only after the investment is made, energy savings measured, and the reduction—if any—computed is the amount of the credit known with certainty. This means that taxpayers can only consider the expected amount of the credit when they make their evaluations of alternative investments. Since many factors, some completely out of a taxpayer's control, could reduce or eliminate the credit, it seems likely that most taxpayers would heavily discount the credit; to obtain a $1 effect of the credit will cost more than $1 of Treasury revenue actually foregone.

Further, there are several perverse features to the proposed credit. One of these perverse incentives is to "goldplate" investments; that is, to deliberately increase the cost of an investment merely to qualify for the credit. To see this, consider an investment of $5 million that saves 100,000 BOE's. The BOE cost is then $10—equals (20 percent times $5 million)/100,000—and the otherwise

allowable credit is therefore reduced to zero. However, an investment of $5.5 million that saves 100,000 BOE's would have a BOE cost of $11. This investment just misses the reduction; the credit would be $1.1 million, and the net-of-credit cost of the investment to the taxpayer would therefore be $5.5 million minus $1.1 million equals $4.4 million. As this example clearly illustrates, the taxpayer contemplating the $5 million investment has a very strong incentive to goldplate it by spending an additional $500,000 in order to qualify for the $1.1 million credit and obtain a net gain of $600,000. While we would not want the credit to distort investment choices in this way, it would be virtually impossible, as an administrative matter, to know when cheaper but equally energy efficient alternatives were available to a taxpayer.

The proposed credit may also prove wasteful, if not perverse, by extending to replacement property. Existing energy tax credits are intended to induce taxpayers to convert to alternate energy sources and modify existing processes to make them more energy efficient. However, as a general rule, incentives are not currently provided for replacement property since energy conservation is an important concern when new assets are acquired. Manufacturers and other purchases of energy consuming equipment are well aware of rising energy costs. These higher costs generally provide sufficient incentives for them to purchase energy efficient equipment. If energy prices alone provide the proper incentives a credit is not only unnecessary, it would cause a misallocation of investment by overly subsidizing replacement investment.

Mr. Chairman, as I reviewed my testimony over the weekend I must say if I were rewriting it at this point I would make this particular paragraph somewhat stronger. It seems to me, as you know from your deliberations over various energy credits in the past, that the conference committee always drops credit for replacement property such as replacement furnaces. The argument has been that when the furnace man comes and goes down in your basement and looks into your furnace and says "I don't know about you but I am getting out of here before it blows up," you replace the furnace and you replace it with a much more energy efficient unit.

A tax incentive to replace the furnace is probably not going to encourage you to replace it much sooner. When it is time to replace machinery and equipment you are always going to replace it with more modern equipment which, given the relatively high price of energy today, will be much more energy efficient than the equipment it is replacing. It is possible in a bill such as this with its broad definition of replacement property that practically all replacement property would qualify for an additional 20 percent tax credit. I think as we review and study this proposal further we should pay particular attention to the appropriateness of subsidizing what may be in fact all replacement property.

Finally, it should be noted that although the bill appears to be aimed at encouraging use of alternative energy sources as well as reduced consumption of oil and natural gas, in practice no credit would be given for conversion to alternate sources unless it was accompanied by a measured reduction in energy use.

The extent to which the objectives of S. 3006 are met also turns on the ability of taxpayers and the Service to measure output and energy saved per unit of output, and to identify the investments that achieved the energy saving.

While I consider the objective of requiring an actual reduction in energy consumption per unit of output as a positive feature of the bill, it entails the extremely difficult task of defining "output" in an administrable way. Although the notion of output seems intuitively straightforward, which may account for the lack of any definition of it in the bill, it is a very slippery operational concept. Consider, for example, a General Motors assembly plant that makes both full size Chevrolets and Chevettes. Is output measured by the total number of cars produced or does it depend on the mix? Should output be measured in physical units—as it is in the bill—or in dollars appropriately deflated? If measured in deflated dollars, the very difficult issue of constructing an index to reflect changing relative prices must be addressed.

Returning to the General Motors example, I should also note that Chevrolets—and Chevettes—vary in body styles, optional equipment, and other features that may affect the amount of energy consumed in their production. Should each configuration be considered a different output? If the answer is "Yes," the number of different outputs produced by a single General Motors plant may be staggeringly large. If the answer is "No," it would be possible to change the measured energy savings from an investment simply by altering the mix of configurations coming off the assembly line. Further, suppose that as part of an energy saving investment, a new type of output is produced. Take, as an example, a plant that made Chevrolets and Chevettes before the investment and makes Chevrolets, Chevettes, and Citations after the investment. Are Citations a unit or should they be measured in the same units as a similar old product? What is a similar old unit? Is a Citation similar to a Chevette? To a Chevrolet? The same issues arise if a product line is dropped; for example, how should output be measured if before the investment the plant made both Chevrolets and Chevettes, but after the investment only Chevettes?

Even before assuming an administrable definition of output can be found, there is the additional difficulty of measuring energy saving per unit of output. The pre- and post-investment periods in which energy consumed and output produced are measured must be stipulated. The two periods should be as comparable as possible to permit a valid computation of energy saving. It is easily seen, for example, that even slight differences in weather conditions and associated heating and cooling costs between the pre- and post-investment period could change the comparison for certain types of production processes. A more subtle and difficult problem would arise in those situations, which may be quite common, in which energy consumed per unit of output changes as the scale of output changes. For example, the energy required to maintain air temperature in a General Motors assembly plant may vary little with the level of output. How comparable are pre- and post-investment periods if the level of output has changed?

As these examples suggest, it is not easy to define comparability without either forcing quite arbitrary comparisons by a strict defi-

nition, in which case desired investments might not qualify and therefore may not be undertaken, or causing administrative difficulties through a more flexible definition. The bill provides some flexibility by stipulating that the pre- and post-investment periods be representative 12-month periods. However, it does not contain a definition of representative, or set a limitation on how recent the preinvestment 12-month period must be—such a limitation is provided, however, for the postinvestment period. These periods would be quite difficult to administer in an evenhanded manner while trying to fulfill the apparent intent of the bill in permitting flexibility.

The other key concept in the bill that must be given an operational definition is the amount of investment qualifying for the credit. To achieve the purposes of S. 3006, it is necessary to separate the cost of investments that reduce energy consumption from the cost of other investments, possibly made at the same time, that have no impact on energy savings.

To illustrate this difficulty consider an investment of $1.1 million, say in equipment, that saves 20,000 BOE's. The BOE cost is therefore $11—equals (20 percent times $1.1 million)/20,000—and the credit $220,000. If the taxpayer undertook a second $1.1 million investment, perhaps a modification to the structure housing the equipment, maybe new cement floors or something similar to that, the total investment would be $2.2 million and the BOE cost—assuming an insignificant BOE saving from the second investment—would be $22—equals (20 percent times $2.2 million)/20,000. The credit would therefore be 20 percent of $2.2 million, or $440,000. Thus, the second investment would lead to a doubling of the credit, but no energy savings. How, as an administrative matter, could a clear distinction be made between the first and second investments, particularly if both are made at the same time? There appear to be no simple answers; expansive definition of qualified investment would extend the credit in a very costly way to many investments that contributed little or nothing to energy saving, while a restrictive definition would remove the incentive to undertake certain investments that the credit is intended to reach.

Further, note that the bill implicitly assumes that all energy saving can be associated with a particular investment in tangible property. This, of course, is not the case; energy use in a manufacturing plant could be reduced simply by having the night watchman turn lights off. In such a case, however, it may be administratively impossible to distinguish the energy saved by the night watchman from, say, energy saved by adding insulation to the building.

Section 3 of the bill would increase the existing energy credits with respect to recycling equipment and most types of alternate energy property from 10 percent to 20 percent. We do not believe that such a change is appropriate at this time. Most of such equipment already enjoys a 20-percent tax advantage over property fueled by oil and natural gas—which is denied the regular investment tax credit. Consideration of increasing the level of credit should be deferred until the effectiveness of the current program can be evaluated.

Mr. Chairman, that completes my statement.

Senator BYRD. Thank you, Mr. Sunley.

You cited some of the positive aspects of the legislation and some of what you regard as negative aspects. Overall I take it the Treasury opposes S. 3006?

Mr. SUNLEY. At this time, yes.

Senator BYRD. Senator Wallop?

Senator WALLOP. Thank you, Mr. Chairman.

I offer you my apologies. It took me an hour 15 minutes to get here. I don't know what I did to the traffic control over the weekend but they certainly have taken their vengeance out this morning.

Mr. Sunley, I guess it does not come as any surprise that the Treasury Department finds itself in opposition to almost any creative proposal that comes out of the Congress. It has been my experience since I have been here that Treasury opposes, and rarely proposes. I wonder if you think that the Treasury Department regulations promulgated by them are even close to, or in harmony with congressional intent under the Windfall Profits Tax and Energy Tax Credit Act with regard to the conservation program?

Mr. SUNLEY. I am not an authority on those regulations but I would say in general when it comes to talking about regulations within the Department we try very hard to walk the middle line where there is a range of interpretation possible. We try to walk the middle ground in terms of what that interpretation can be. Let me cite one recent example.

The press recently criticized the Treasury Department and IRS for putting out what they viewed as rather silly regulations relating to a vacation home. You may have seen this in the real estate section of some of the newspapers. I agreed with the articles; the regulations seemed rather silly. I went back and took a look and found out why we put the regulations out.

It traced exactly to the Senate floor debate where one Senator would ask another, "Suppose a guest comes up for the day? Does he have to work part of the day?" One Senator would say, "Yes, that is our intention. Anyone who is there has to be working on the property during that day or the property is being used as a vacation home."

Senator WALLOP. I wonder if we could try to focus on energy conservation.

Mr. SUNLEY. I am trying to make the general point that often we do not have as much flexibility in writing the regulations as some people may think. We often are really limited by some of the colloquies that have taken place on the Senate floor and on the House floor. We do the best we can to try to walk the middle line and strike what we see to be the reasonable interpretation given the legislative history which we have to live with.

Senator WALLOP. All I can say is that there will be some testimony that trails yours complaining about the lack of understanding, and lack of commitment to the purposes of the conservation sections under the Windfall Profits Tax and the Energy Tax Credit Act in both directions.

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Now you have indicated some concern that the company might goldplate a project to increase the cost of the conservation project in order to earn a higher credit. Would the Treasury recommend reducing the $55 limitation to limit the scope of incentive to goldplate projects?

Mr. SUNLEY. The problem relates to the $11 break point. If you are a little bit below the $11, for example, if the BOE cost is $10, you get no credit. If you increase the cost of your investment, saving the same amount of energy, the BOE cost gets above $11, you qualify for the credit, and you get 20 percent of the whole cost.

Senator WALLOP. Would the Treasury recommend elimination of the $11?

Mr. SUNLEY. No, we would not. I think the goal, and I tried to say this very clearly at the beginning of my statement, of your proposal is very laudable. What you are trying to do as I understand it with the $11 break point is to identify those investments where the energy savings relative to the cost of investment are so great that they would be undertaken without subsidy and so you don't need to provide a 20-percent subsidy. That is the correct goal. Possibly you need to eliminate this notch where if you are a penny below the $11 BOE cost you get no credit; if you are a penny above, you get a 20-percent credit.

Senator WALLOP. Would the Treasury recommend anything in there?

Mr. SUNLEY. If I had been asked to draft this bill I would have made certain that there was not a notch.

Senator WALLOP. How would you approach that?

Mr. SUNLEY. You would have a range where you would phase up to the 20-percent credit.

Senator WALLOP. If there were a phaseup, would Treasury then find the bill more acceptable?

Mr. SUNLEY. Sure. This particular concern that we have of goldplating—I am not enough of an energy expert to know whether $11 BOE cost——

Senator WALLOP. That was the old control price of oil. That was the logical place to begin. What we were trying to do obviously was to provide the country with some assurance that it was buying in fact a product when it supported the investment through the investment tax credit and that there was something that the public could get in return to be assured that what was otherwise not profitable for a company or a higher risk in terms of other capital considerations, would be profitable and some companies would make that investment.

. The Finance Committee this month, Congress in general, has taken a strong interest in the use of tax credit to promote energy conservation and conversion to alternate fuels. I mentioned the energy tax credit and we still do not know how effective, if at all, these credits have been. I wonder if the Treasury could provide the committee with a letter or report on how many companies have taken advantage of the 1978 tax credit and it would be helpful if you could break it down into categories of eligible property.

Mr. SUNLEY. I will check and see what data is available on that. Most of those 1978 credits were really first claimed on the 1979 returns. Corporate 1979 returns were just filed 2 weeks ago, calen-

dar corporations filing September 15. So I suspect there is very little data yet available on the 1979 tax returns. Let me see what is available and I will be glad to include it in the record if some data is available.

[Material was submitted by Mr. Sunley:]

Energy Tax Credits Claimed on Individual and Corporate Returns

	Returns Processed in Calendar Year 1979		Returns Processed Since January 1, 1980	
	Number of Returns	Amount of Credit ($000)	Number of Returns	Amount of Credit ($000)
Individual Returns				
Residential energy credit, total	5,845,289 1/	578,919 2/	4,483,409 3/	440,893 2/
Insulation and other conservation		564,123		399,726
Solar and other renewable energy sources		33,597		42,783
Business energy investment tax credit, total	2,429	2,599	5,235 3/	6,701
Energy properties other than solar and wind		1,179		3,620
Solar and wind energy properties		1,420		3,081
Corporate Returns				
Business energy investment tax credit, total	1,515	135,964	2,325 4/	27,440
Energy properties, other than solar and wind		135,459		27,187
Solar and wind energy properties		505		253

Office of the Secretary of the Treasury
Office of Tax Analysis

October 10, 1980

Note: All figures are based on unaudited returns as posted to the IRS master files.

1/ Includes 1978 returns claiming credit for eligible expenditures made in 1977.

2/ Total residential energy credit allowed; detail represents tentative credit before limitation to total tax liability for year. Excess credits may be carried forward to subsequent years.

3/ Returns processed through July 19, 1980.. Virtually all individual returns are filed and processed by this date.

4/ Returns processed through June 30, 1980. Most large corporate returns are filed and processed in the last half of the calendar year.

Senator WALLOP. The President recently made a statement in support of the refundable investment tax credit. I wonder if Treasury would support the use of refundable tax credit for conversion to alternates.

Mr. SUNLEY. You are quite right. The Treasury does support making the regular investment tax credit refundable. If that credit is made refundable the logic behind it may very well extend to other business tax credits.

Senator WALLOP. I am asking you in terms specifically of the energy conservation or energy conversion to alternate fuel.

Mr. SUNLEY. I said in my testimony, Senator Wallop, we do not endorse this bill today.

Senator WALLOP. I am talking about the concept of refundable tax credits and energy conservation and conversion to alternate fuels.

Mr. SUNLEY. In general we are endorsing the concept of making the investment credit refundable. I would think that would probably extend to the various other kinds of specialized investment credits that we have put in the tax code in the last several years.

Senator WALLOP. Has the Treasury had any consultation with the Department of Energy on either this bill and its purposes of the——

Mr. SUNLEY. My testimony was cleared by OMB and was approved by the Energy Department.

Senator WALLOP. The Energy Department thinks there would be no credible savings worth the 20 percent?

Mr. SUNLEY. That is not my testimony. I indicated that we have great concerns whether the bill as drafted can be administered. The bill does not tell us what output is, how you measure your output.

Senator WALLOP. You turned down the opportunity to write another regulation.

Mr. SUNLEY. We certainly did. You recall in the Windfall Profit Tax we begged this committee to remove the Secretary's discretion on adding items to the list. Some of these problems, as you indicated, we were blamed for the other day by witnesses. We feel we cannot administer some of these laws.

Senator WALLOP. The problem is that you have come up here in opposition with no creative proposals and surely it has been a part of the President's publicly stated program and part of the Department of Energy's publicly stated program that this country must get under way with an effective means of providing energy conservation and reduce the amount of imported oil. It is one thing to come up merely to oppose this. It is another thing to come up and try to get somewhere with what we are trying to do. It is one thing as well to support what you state are laudable goals but then you tear the rest of the bill apart as unworkable and unadministrable without in any way trying to provide a means by which the Congress, the administration, and even the public might work together to achieve the goal.

Mr. SUNLEY. I spent a fair amount of time last week talking to some of the people involved in drafting this bill, trying to see if they had solutions to certain problems. Let me describe the output problem for you. Suppose Chrysler Corp. produces Imperials this

year and next year they take that line out, that whole production line, and next year they produce the K car, the little car. What is the unit of output? If the unit of output is the car, then the energy cost per unit of output may be substantially less.

Senator WALLOP. Mr. Sunley, that is obviously something that can be dealt with by the language within the legislation itself or by regulation. There is no reason to suppose that anybody is going to talk units in terms of exactitudes when you are building tanks and Honda motorcycles if they are coming out of the same plant.

There is a standard of comparability that can be developed and the company can be required to justify it. That does not seem to me to be a matter of impossibility. That seems to be drawing a piece of opposition out of the sky.

Mr. SUNLEY. Let me add one more comment in that area, Senator Wallop. In 1978 the administration proposed using the tax system to provide an incentive to hold down wages. We were criticized for not making a similar proposal on the price side. We concluded within the administration that there was no practical way to develop the kind of output index that would be necessary to determine whether a firm raised its prices in a way that an IRS agent, wearing a green eyeshade, could go in as an accounting matter and make this determination.

I must say at this time that every business group we meet with assured us that there was just no practical way of measuring a price increase because it would require an output index. You would have to construct such an index.

I would think the kinds of problems that we faced when we were trying to develop a tax incentive to hold down price increases are the same kinds of problems that would be involved here in measuring the basic units of output between some preinvestment period and some postinvestment period and making sure they were comparable. You may say that this is something that we could handle by regulations, but we have no guidance in the bill before us. The term output is not even defined. Maybe the author of the bill, the draftsman of the bill, did not realize that output was going to be a very tricky concept. I do not know for certain. To leave something like that to regulations is far beyond the scope of the kinds of problems that IRS is really capable of dealing with.

Senator WALLOP. I assume Treasury would have made a suggestion of a definition about it.

Mr. SUNLEY. We have worked a good deal on just that issue in terms of trying to develop a tax incentive for firms to hold down prices and we were not able to solve that. In the case of the labor side you can define a unit of labor, man hour of labor, and you can make some of the calculations that underlie the President's proposal for real wage insurance which I think was something that IRS was capable of administering. We could not do it on the price side.

Senator WALLOP. I find it regrettable. The fact is that investment credits do work. That was one of the primary reasons we went in this direction. What doesn't work and what doesn't provide very efficient returns to the country are large grants that are haphazardly scattered across the country in the hope that by throwing them deep enough there will be an energy savings resulting.

At least we sought to be responsible enough to give the country some confidence that if it was in fact investing its tax collection capability it would in fact be purchasing real energy returns for the country. That is what we have tried to do. I think in the long run even Treasury would have admitted that it is a more efficient way of getting at the grants, the loan guarantees, and all the other things that have been proposed.

Thank you.

Senator BENTSEN. Mr. Sunley, I can recall when we were discussing TIP problems of course you said that is an easy one to do. It may be that even then I had a great deal of concern really trying to measure productivity in that situation.

Mr. SUNLEY. If I said it was easy, I misspoke. I thought we could do it. I recognized it was going to be hard.

Senator BENTSEN. I have no further questions, thank you very much, Mr. Sunley.

Our next witness is Dr. Charls Walker. Dr. Walker, we are pleased to have you here.

Senator WALLOP. Mr. Chairman, I was late and I apologize. The traffic intruded into my best intentions. I have a brief opening statement. I wonder if I could deliver it?

Senator BENTSEN. Yes. Why don't you go ahead?

Senator WALLOP. I wish to open by thanking the chairman of the Subcommittee on Taxation and Debt Management, Senator Byrd, for holding this hearing and giving the committee this opportunity to review testimony on S. 3006, the Industrial Energy Efficiency and Fuel Conversion Act of 1980. This legislation reflects a year of close consultation with energy conservation experts in industry, government, and academia.

Today's hearing is a continuation of that analytical process, which aims at developing a cost effective program for stimulating industrial investments in conservation, fuel conversion, and recycling.

There is disagreement and confusion in nearly every aspect of our energy debate, yet there is widespread agreement that energy conservation must play a crucial role in our energy future. The Nation's energy policy must rely on aggressive efforts to produce more energy from fossil fuels and renewable resources, but at the same time we must assure that our energy resources are used efficiently in all segments of the economy.

The Industrial Energy Efficiency and Fuel Conversion Act of 1980 focuses on energy use in the industrial sector because industry accounts for nearly 40 percent of our Nation's energy requirements. This legislation will stimulate investments in industrial conservation, conversion, and recycling by increasing the energy investment tax credit to 20 percent and offering the energy tax credit to an expanded array of investments.

The central feature of the legislation is that it has no revenue effect unless an energy saving can be demonstrated. Even after an energy savings is demonstrated, the bill will only provide incentives for conservation projects that are not yet commercially attractive for industry. Finally, the legislation will not subsidize conservation projects whose energy savings are not competitive with the cost of energy produced from synthetic fuels.

These features allow S. 3006 to provide incentives only for a targeted range of cost effective industrial energy investments. Carefully targeted incentives for more efficient industrial energy use can bring about an immediate and cost effective reduction in our energy requirements, and accelerate the conversion to alternate fuels. There should be no confusion about the character of industrial energy conservation and efficiency that this legislation will promote. This bill will stimlulate massive investments to retool, insulate and upgrade our Nation's factories so that we can increase production with an eye toward energy efficiency and reduce dependence on foreign oil.

Investments in industrial energy efficiency do not have to wait for developments in technology or pilot projects to prove that insulation or new processes can reduce energy consumption. The technology and equipment needed to convert to coal and increase industrial energy are available, in the same way that the technology to increase productivity in American industry is at hand. The scarce commodity in dealing with energy efficiency and higher productivity is capital. Energy conservation is essentially a capital formation issue.

Tax incentives for energy conservation should proceed in conjunction with broad based capital formation incentives. By linking targeted incentives for conservation with more general capital formation measures, we can be assured that industry will have the incentive and the capital required to address the challenges of productivity and efficient energy use.

The Finance Committee has begun the process of addressing the fundamental capital formation problems in the economy by passing a bill that provides new incentives for individual saving and business investment. Although it appears that this bipartisan Finance Committee bill will not be enacted in the 96th Congress, the committee is in agreement that capital formation tax issues will be the first order of business in the 97th Congress.

I intend to work toward the passage of another broad based capital formation bill next year, and I will also attempt to expand next year's bill to include tax incentives targeted for industrial energy conservation, conversion to alternative fuels, and recycling.

I look forward to working with my colleagues on the Finance Committee on passing a capital formation and energy conservation bill next year.

Thank you.

Senator BENTSEN. I will say to my distinguished friend from Wyoming when he talks about capital formation I recall forming a Subcommittee on Capital Formation in 1973. Some wanted to know if it had something to do with the architect of the Capitol. I think it is an idea whose time has come. It is desperately needed. We are very pleased to have this morning Dr. Walker who has appeared many times before us, has contributed a lot to the decisions of this committee. I would like for him to also introduce his associates with him this morning for the record.

STATEMENTS OF DR. CHARLS E. WALKER, CHARLS E. WALKER ASSOCIATES, WASHINGTON, D.C., ACCOMPANIED BY KEITH JUNK, ASSISTANT GENERAL MANAGER OF THE ENERGY PRODUCTS AND VENTURES GROUP, OWENS-ILLINOIS

Mr. WALKER. I will be glad to do that, Mr. Chairman.

It is a pleasure to be here today to discuss with you the vital subject of energy conservation. Our firm, Charls E. Walker Associates, represents an ad hoc group of 15 large industrial users of energy and I am accompanied by representatives of five of these companies whom I will introduce.

On my far left is Mr. Keith Junk who is assistant general manager of the energy products and ventures group of Owens-Illinois.

Next is Mr. L. A. Redfern, who is comptroller of the Lone Star Steel Co.

Next is Mr. Clay A. Poole, vice president of engineering services, for Owens-Corning Fiberglas Corp.

Fourth is Mr. R. S. Wishart, Jr., director, energy and transportation policy, energy supply and services, for the Union Carbide Corp., and fifth is Mr. Richard B. Pool, associate director of energy, Kaiser Aluminum and Chemical Corp. These gentlemen have short statements to show what this legislation will do for these companies, which I will ask them to give at the end of my brief oral presentation, if we might.

Senator BENTSEN. How much time are you asking for? I understood there had been an arrangement on the time.

Mr. WALKER. I don't know the precise arrangement. I think we will come well within your limits.

Senator BENTSEN. Dr. Walker, I have a great friendship for you. I would like to have some parameters here of what we are talking about.

Mr. WALKER. Would you agree with 12 to 15 minutes?

Senator BENTSEN. I understood it was 5. We will settle for 12.

Mr. WALKER. We are here to lend our support to legislation introduced by Senator Wallop to provide for additional conservation incentives. We strongly support this legislation.

At this time we would like to ask that my entire statement as submitted to the committee be made part of the official record of this hearing.

As this committee is well aware the United States is overly dependent on insecure foreign supplies of energy. One need only look at the current situation in Iraq and Iran to be reminded of that insecurity. Our views match those of a wide range of energy experts in and out of Government, experts who view a program designed to accelerate conservation as an essential part of the energy bridge that must be constructed if this Nation is to move safely through the 1980's into the 1990's when alternative sources of energy will become more available.

Increasing energy efficiency is viewed by many as the quickest, most effective, least expensive and most environmentally sound way of reducing American dependence on foreign oil. The potential savings are dramatic. Stobaugh and Yergin in their widely read book "Energy Future" estimate that a balanced energy conservation program could by the late 1980's yield the energy equivalent of our prerecession oil imports, an amount equal to 8 million barrels

per day. They further point out that the industrial sector, which currently consumes about 36 percent of the Nation's energy, could provide a significant portion of these savings.

We would like to make it clear that we are not talking about industrial conservation through minor changes in operations. The easiest things have already been done and future reductions will be more difficult and costly to achieve. The experts are in general agreement that business investment in energy efficient plants and equipment must be increased sharply in order to succeed.

Such efforts will involve extensive retrofitting, alterations of processes, and acquisition and installation of major new plants and equipment. In the vast majority of cases, the technology currently exists to make these improvements. The primary reason they are not being made is the shortage of investment capital that exists generally in industry today.

While the expected energy savings to be realized from such investments may eventually cause them to be made, the issue for Government policymakers is whether such investments should be accelerated through Government incentives. In today's capital short environment, many of the investments so important to this Nation's interest will likely be postponed or not made at all.

After making those investments mandated by Government regulations in areas such as environmental control, as well as those with a higher potential return or which serve a more immediate business purpose, a company's cash flow may not be sufficient to permit it to make energy savings investments. What is needed is a mechanism to make energy conservation investments more attractive if done now rather than at some later date.

In order to accelerate business investment in energy savings plants and equipment to the levels necessary to help insure energy security through the 1980's and beyond, Government must recognize its role in creating the current situation, and determine thereafter an appropriate role in alleviating it. First Congress should recognize that much of the nonenergy efficient industrial plant and equipment in place today is there because Government price controls on oil and gas kept energy costs artificially low. This in effect created a Federal disincentive to installing higher cost energy efficient equipment.

Second, it is important to recognize that there are significant secondary costs associated with our large import bill. These costs, having to do largely with balance of payments and energy security effects, are external to an individual company's accounting. Federal policy should recognize the benefits flowing to the general public from reductions in gas and oil use, and should recognize the national advantages of foregoing certain revenues to encourage those energy-use reductions.

Federal incentives, to be effective must recognize both the general shortage of available capital to American industry and the need to elevate the priority accorded conservation investments consistent with our national energy policy.

In order to deal with the general capital shortage which currently exists in industry, some form of general industrial investment incentive is desirable. This committee has recently reported out

legislation which is a good first step toward a more appropriate capital cost recovery schedule.

However, the needed boost to energy conservation investments will not be sufficiently encouraged merely by enactment of effective capital cost recovery legislation. We also need to provide targeted incentives for conservation investments which are reflective of the priority accorded conservation in our national energy policy.

Our goal, in short, must be to accelerate the rate at which energy-conserving investments are made.

The problem for Congress is how to design an incentive program to maximize the impact on business decisionmaking, while getting the biggest "bang for the buck."

We favor use of the investment tax credit approach simply because investment tax credits work—they accomplish their intended result.

Senator Wallop, you are to be commended for the leadership you have shown in facing up to this issue. Your legislation builds well on the limited benefits provided through existing law. By focusing on process and systems changes in a relatively straightforward manner, while at the same time assuring that no credits are made available unless energy is actually saved, you have developed a workable and effective proposal.

S. 3006 provides for a 20-percent credit for qualified investment. However, it makes this credit subject to a ceiling—it cannot exceed $55 for each barrel of oil equivalent saved in one year, based upon preproject levels of production. Such a ceiling provides assurance that the Government will not be providing unlimited incentives for inefficient methods of conserving energy. We support this concept.

At the other end of the scale, however, no credit is allowed where the credit for each barrel of oil—or its equivalent—saved by the otherwise qualified investment is $11 or less. We are concerned about the need for, and desirability of, this limitation. We therefore recommend that the committee eliminate it.

First, the imposition of the $11 floor assumes that all projects, or at least a substantial majority of projects, to which the limitation would apply are proceeding, or will proceed, without further incentives. The experiences of the majority of our group indicate that this is not the case.

Second, and more importantly as far as the Nation is concerned, the projects that would be denied any credit under the $11 floor are generally the ones that return the greatest energy savings per dollar invested by industry, and of necessity per dollar foregone by the Treasury. Thus, the return to the Nation on these projects is greater in terms of energy security than on the other investments for which incentives are to be made available under this legislation.

With this modification and the other changes outlined in our written statement, we believe this approach has great potential for increasing the rate of energy conservation investment in industry. We strongly support Senator Wallop's efforts.

Mr. Chairman, this is truly an issue with broad-based nonpartisan support. We urge this committee to move it along as rapidly as possible. Thank you very much. If we have some time I would like to yield to my associates.

Senator BENTSEN. You have some time. We have a whole list of witnesses; that is the only reason to put a limitation on your time. I, too, have conflicting commitments this morning. I am going to turn the Chair over to Senator Bradley.

Who is your next speaker?

Mr. WALKER. I will ask Mr. Junk to start out.

STATEMENT OF KEITH JUNK, GENERAL MANAGER, OWENS-ILLINOIS, INC., SUNPAK BUSINESS UNIT

Mr. JUNK. Good morning. I am Keith Junk, general manager of Owens-Illinois Sunpak operations, a business that Owens-Illinois is building around two key elements: first, an invention that is highly effective at substituting solar energy for conventional energy sources, and, second, a belief that this country can, and will, accelerate the move toward energy efficiency.

I have prepared a written statement which underscores Owens-Illinois' support for bill S. 3006 and the need for changes that will be outlined by others on the panel.

As general manager of Sunpak, I am faced daily with the very issues that you are addressing in this bill.

I recognize that the industrial energy user offers a huge potential for conserving previous conventional fuels by investing equally precious capital resources.

I see the industrial energy user making investment decisions with the current energy pricing and availability as his baseline for economic justification.

I see the industrial energy user taking a neutral posture because of the great uncertainties he faces in several areas, such as technological change, tax and depreciation policies, the investment climate, and many others.

Our evaluations suggest that solar energy working in combination with good industrial energy management can do something about the continued dependence on imported oil, and we can do it now. The solar technology, such as Owens-Illinois' evacuated tube, is here today.

But we are attempting to build this new business in an environment where current tax laws permit the industrial user to deduct 46 cents of his energy cost while capital investments in solar must be written off over many years. We also compete in an environment where past Government incentives have established a low cost and controlled, conventional energy production and distribution system, while solar investments must be made with new, inflated dollar capital.

Our economic studies show that solar investments for the industrial energy user can work today, but left unaided will naturally occur in the mid-1990's. With an effective incentive policy—such as a 40-percent tax credit and a 2- or 3-year depreciation writeoff—that program will make solar viable in the mid-1980's, and with the economies of production that we know about today, when you get the industrial buyer installing large, effective solar systems, the solar costs will drop significantly and you will see a viable solar industry in the early 1980's.

I appreciate the opportunity to talk with you today and the efforts you are making to accelerate the market process of doing something about our dependence on conventional fuels.

While this bill as currently drafted may marginally help the process of moving solar energy alternatives forward in the industrial sector, we believe that the bill would be further improved if the industrial application of solar were added to the definition of energy property in section 3 of the bill.

This bill is a visible recognition that the United States must seriously consider incentives as a powerful tool to move forward in energy self-sufficiency.

[Prepared statement of Mr. Junk follows:]

STATEMENT

SENATE FINANCE COMMITTEE

September 29, 1980

Keith Junk, General Manager

Owens-Illinois, Inc. SUNPAK Business Unit

S. 3006

Mr. Chairman:

My name is Keith Junk. I am General Manager of Owens-Illinois' SUNPAK™ solar energy operation and Assistant General Manager of our Energy Ventures Group.

I am pleased to have the opportunity to present Owens-Illinois' viewpoint regarding bill S. 3006. While my remarks will primarily address the opportunities to conserve precious oil and natural gas through the application of solar energy in business and industry, I also wish to discuss briefly S. 3006 as it relates to Owens-Illinois' energy conservation activities in its principal industrial operations.

I wish to begin by complimenting Senator Wallop for the leadership he has shown in identifying the vast opportunities for saving oil and natural gas in the industrial sector and for the initiative shown in introducing S. 3006 on the floor of the Senate. The current events in the Middle East dramatically underscore the importance of taking measures such as this to reduce our nation's dependence on imported oil.

Owens-Illinois is one of the world's largest producers of glass, paper, plastic and metal packaging products and as such, is also a major industrial energy consumer with a very strong interest in energy conservation and innovative energy-saving technologies. Owens-Illinois has made very significant progress in improving the energy efficiency of our packaging operations and thereby reducing our energy consumption on a unit-of-output basis. However, we strongly believe that additional tax credits are necessary if we are to be able to maintain our historical rate of progress and to accelerate investment in new projects with energy-saving potential in the extremely competitive capital environment in which we operate.

Accordingly, we strongly endorse the 20% tax credit provided in S. 3006 for "alternative energy property and

specially defined energy property," as those properties are defined in existing legislation. We also support S. 3006's creation of a new class of "qualified industrial energy property" eligible for the 20% energy tax credit proposed by this bill since the new provision should provide incentive for industrial energy-saving projects not covered under existing legislation.

We do have certain concerns about some features of S. 3006, specifically:

(1) We question whether an additional 20% energy tax credit will provide sufficient incentive to encourage certain major energy conservation investments in view of current capital constraints; we believe that a 40% or 50% credit, such as is provided in some European countries, may be necessary.

(2) We are concerned about the lack of express reference to cogeneration equipment in S. 3006. While many types of cogeneration equipment would likely be considered "qualified industrial energy property," we believe express reference to cogeneration equipment in S. 3006 would be appropriate in light of the repeated emphasis put on the energy-saving potential of cogeneration in many recent energy studies, such as the Harvard Business School study.

(3) We believe the $11 BDOE threshold test in S. 3006 is unnecessarily restrictive.

We would appreciate the opportunity to provide this Committee with additional written comments on specific types of energy conservation equipment that have potential for application in our industrial operations and could be affected by S. 3006. We would plan to provide such additional comments

within the next two weeks.

Turning to the subject of solar energy property, Owens-Illinois has developed an innovative solar technology that is capable of heating water or air to significantly higher temperatures than the conventional flat plate solar collectors. These higher temperatures allow solar energy to be used for a broad range of industrial and business applications. Our SUNPAK™ evacuated tube collector is in operation in more than 100 U. S. and Canadian installations. It operates well on cloudy days and on days with temperatures below freezing. A typical industrial SUNPAK™ installation has an active collector area ranging from 500 to 13,000 square feet. In comparison, a residential system would normally use a collector with an area of about 50 square feet. We believe the American business market represents the best opportunities for rapid and cost effective development of accelerated production of solar energy equipment.

Like other investments to conserve oil and natural gas, solar investments require a significant initial capital investment that results in a payback from energy savings occurring over a period of time. High interest rates, inflation and a shortage of capital make it difficult for solar to attract these investments.

Today, the major obstacle to solar energy in business applications is its cost relative to oil and natural gas. Continued use of oil or natural gas requires no capital expenditure while a solar installation requires a substantial capital expenditure.

The disparity in cost between a solar installation versus the continued use of oil and natural gas is reflected in our current tax laws. The purchase price of oil and natural gas may be deducted for federal income tax purposes by businesses which are currently paying tax at the 46% rate. Thus, the net cost to business of oil and gas is fifty four cents per

dollar spent on such fuels. Unlike oil and natural gas costs, capital expenditures for solar equipment must be capitalized and depreciated over a period of several years. This factor, when coupled with the heavy cost of borrowing to finance solar equipment, indicates the need for tax incentives for solar energy which will allow it to compete on equal footing with oil and natural gas.

To summarize Owens-Illinois' position, we strongly endorse the 20% tax credit provided in S. 3006 for investments in energy-savings equipment that could be used in our manufacture of glass, paper, plastic and metal products. We also support the incentive that S. 3006 would provide to business users of solar energy equipment because these applications have a great potential to reduce our dependence on imported oil. Finally, Owens-Illinois believes that the present threats to our economy and to our national security which are posed by U. S. dependence on unreliable sources of expensive foreign oil are sufficiently serious to justify the more rapid acceleration of use of conservation technology which could be stimulated by a 40 to 50% tax credit.

Material Supplied for the
September 29, 1980, Hearing
Record on S. 3006 by
Keith Junk, General Manager

Owens-Illinois, Inc. Sunpak Business Unit

SUPPLEMENTAL TESTIMONY ON THE WALLOP BILL S. 3006

We are indeed pleased to have the opportunity to offer supplemental testimony.

First, let me say that for the calendar year 1981 and the immediate period beyond, we anticipate that the supply of capital within Owens-Illinois will be tighter than ever before. This means that many long term investments, including those which would conserve energy, will be deferred in favor of others necessary to maintain current operations. The impact of this is that simple paybacks that were acceptable in years past will no longer be acceptable. In addition, for items which involve the introduction of new technology with its accompanying risk factor, still greater returns and faster paybacks will be required.

The following comments are assembled following an objective review of recent planning activities. It is also important to note that they are based on prevailing energy prices.

For this testimony, it is assumed that the machinery or equipment would qualify for both the regular 10 percent investment tax credit (ITC) and an additional energy tax credit (ETC) (now 10 percent, but for discussion purposes, 20 percent or 30 percent).

To present data for this statement in a systematic manner, we asked three questions in reviewing recent and current energy conservation investment decisions:

1. At a combined 30 percent tax credit rate (10 percent ITC and 20 percent ETC), will approval for the expenditure

be given for an asset which is defined as energy property under existing legislation (the Energy Tax Act (ETA) or the Windfall Profits Act (WPA)?

2. At a combined 30 percent tax credit rate, will approval for the expenditure be given for an asset which is qualified as industrial energy property under this Bill and whose cost of oil equivalent, also defined in the Bill, is in the range of $11-55 per barrel?
3. At a combined 30 percent tax credit rate, will approval for the expenditure be given for an asset which is qualified as industrial energy property under this Bill, except that its cost of oil equivalent is less than $11 per barrel?

The first question addresses investments in waste heat boilers for glass furnaces. The ratio of total* capital cost to annual barrels of oil saved is about $40 per barrel. We do not believe, for the near future, that these devices will be installed with less than a 40 percent combined tax credit rate.

Measures which fall under Question 2 (measures which do not qualify under current legislation but would fully qualify under this Bill for energy investment tax credits) include the replacement of existing electric motors with higher efficiency motors, the installation of cogeneration equipment on glass furnace waste heat recovery and numerous process changes. The replacement of existing electric motors with energy efficient motors has an oil price of about $16-17 per barrel. The simple payback is three

to four years. It is unlikely that a 30 percent total tax credit would succeed in getting this measure implemented. It would likely require a 40 percent combined tax credit to make the measure attractive.

Cogeneration is the name given to processes which can be added to existing energy uses and produce a second form of energy. Capturing the available energy in the waste heat from glass melting furnaces and using it to produce electricity is another example. It has an equivalent price of oil in the same range as the energy efficient motors. Similarly, it would require a 40 percent combined investment tax credit to encourage implementation (even with some contribution of government funding because it's a developing technology). Further, several process changes we have investigated have the same range of equivalent value of oil and would be substantially speeded by a total 40 percent investment tax credit.

Measures which fall under Question 3 include energy management systems and improvements to lighting systems. This class of energy saving equipment includes instances where measures are being implemented already. Generally, where the equivalent price of oil as defined according to this Bill is under $6.25 per barrel, these measures are put in service. In general, those cases where the equivalent price of oil is over $6.25, some additional incentive will be required before these measures are undertaken. For items which fall below $11 and above $6.25 in equivalent price of oil, we would see a combined investment tax credit of 30 percent as

sufficient to speed implementation of these items. Without some added financial incentives, investment in some items which fall below $11 per barrel figure will be postponed.

The attached table summarizes our projection of the likelihood of implementation of various energy conservation measures with and without appropriate tax incentives.

Another way to look at the items discussed above is to consider that the range of credits (where the equivalent price per barrel of oil as defined under this Bill is $15-20 per barrel) equates to a total of $75-100 <u>total</u> capital per annual barrel of oil saved. A 40 percent combined investment tax credit is equivalent to $30-40 per barrel of oil. On such a basis, this level of energy tax credit buys the first year's displaced oil, and afterwards the balance of payments deficit is reduced by that amount.

We support this Bill and believe the proposed 20 percent energy credit is a reasonable and effective measure to help stimulate investment in industrial energy conservation. An increase in the proposed energy credit rate to 30 percent would provide a more effective incentive to promote energy conservation.

*<u>Note</u>: This is different than the definition under S. 3006 (which uses 20 percent of the total investment).

SUPPLEMENTAL TESTIMONY TO S. 3006

ESTIMATE OF IMPLEMENTATION OF MEASURES AT ASSUMED COMBINED TAX CREDIT RATES

ENERGY SAVING MEASURE	QUALIFIES UNDER EXISTING LEGISLATION	QUALIFIES UNDER S. 3006	TOTAL*INVEST. $ PER ANNUAL BBL. OF OIL	PROJECTION OF IMPLEMENTATION COMBINED TAX CREDIT RATE 10%	20%	30%	40%
Waste Heat Boilers (fuel displacement)	Yes	Yes	35-40	No	No	Yes	Yes
Cogeneration as bottoming on waste heat, energy eff. motors (electric displacement or svgs.)	No	Yes	75-85	No	No	No	Yes
Process changes (fuel savings)	No	Yes	65-75	No	No	No	No
Energy Mgmt. Syst.	No		15-45				
		No	15	Yes	Yes	Yes	Yes
		No	30	No	Yes	Yes	Yes
		No	45	No	No	Yes	Yes
Lighting Eff. Impr.	No	No	15	Yes	Yes	Yes	Yes

*Note: This is different than the definition under S. 3006 (which uses 20 Percent of the total investment).

Mr. WALKER. Mr. Redfern of Lone Star Steel Co.

STATEMENT OF L. A. REDFERN, COMPTROLLER, LONE STAR STEEL CO.

Mr. REDFERN. The Lone Star Steel Co., a part of the primary metals industry, dating back to the early 1940's, is a vertically integrated steel company approximately 150 miles east of Dallas, Tex. Lone Star ingot products, which are roughly 1 percent of the total domestic raw steel production capacity, are finished into steel pipe and tubes which are used primarily in the production and transportation of oil and natural gas.

Steel companies such as Lone Star Steel Co. are mammoth consumers of energy derived from oil and natural gas; therefore, Lone Star Steel has invested in several and continues to evaluate the economics of several more major energy conserving capital investments. One such investment of the order of magnitude of $150 to $200 million is a major process change to continuous slab casting.

Lone Star Steel now uses a traditional steel industry process to cast molten steel into ingot molds, followed by reheating and processing the ingots into slabs. When the ingots are cool enough to have the mold removed, much of the latent heat has been lost. To roll or to shape the ingots into slabs or blooms, they must be reheated to a uniform temperature.

Heating is done in a gas or low sulfur oil fired insulated chamber called a soaking pit. After the ingots are so heated, they are taken to the rolling mill and rolled to slab or tube dimension. A relatively new energy method of producing slabs from molten steel is to continuously cast them. This technique bypasses and replaces the energy intensive ingot soaking pit slab mill process. Significantly less energy is required for the continuous slab casting process. It will save over 1.1 million BOE's per year at Lone Star Steel.

Another major investment which would be made concurrently with the continuous slab process, also in the order of magnitude of $150 to $200 million, is for a change in Lone Star Steel's refining process. Lone Star Steel now uses the open-hearth furnace process for producing steel. This technology is about 100 years old and produces something like 20 percent of the steel made in the United States and Canada. The open-hearth process uses natural gas and/or fuel oil plus oxygen to melt scrap and to refine the steel.

The basic oxygen furnace process is the alternative to the Lone Star open-hearth process which we are considering. No external heat source is needed for the BOF process itself. The heat necessary to sustain refining is generated by reacting pure oxygen with carbon in the molten iron charge used for the BOF. This process change can save in excess of 1 million BOE's per year from oil and natural gas while consuming less than half that amount from coal and coke.

In my opinion, this proposed legislation would have a very significant and beneficial effect in obtaining the funding for the investments that I have described and, furthermore, would assuredly accelerate any such funding decisions.

Thank you.

Mr. WALKER. Mr. Chairman, we have used our time. We will be happy to put the other statements in the record and respond to your questions.

Senator BRADLEY. Thank you very much, Mr. Walker.

[Prepared statements of the panel follow:]

STATEMENT OF RICHARD B. POOL, ASSOCIATE DIRECTOR OF ENERGY, KAISER ALUMINUM & CHEMICAL CORP.

My name is Richard Pool; I am associate director of energy for Kaiser Aluminum & Chemical Corporation. Kaiser aluminum is a worldwide company with sales of approximately $3 billion per year. As part of the U.S. aluminum industry, we are also large consumers of energy. The aluminum industry presently consumes approximately one quad of energy per year out of the 79 quads total U.S. consumption. The predominate energy form is electricity used in the aluminum smelting process.

Our company believes energy conservation is the most important, untapped new energy source for the 1980's. We see conservation, along with accelerated production of domestic energy, as the principal strategy to keep the U.S. economy growing while reducing dependence on foreign oil. The U.S. industrial sector has a significant potential for improved energy efficiency, but there are a number of serious barriers blocking the earlier realization of a large portion of the potential energy savings.

Kaiser aluminum believes S. 3006 is one of the most important pieces of energy legislation offered in several years. It recognizes the very large energy saving potential which can be realized in the industrial sector and establishes a powerful framework that will induce these energy savings investments to be implemented on an accelerated basis. We wholeheartedly endorse the concepts embodied in the bill including tax credit incentives, cost effectiveness tests and early implementation. We believe these features represent the essential ingredients to legislation which will rapidly move American industry to energy efficient plants and equipment in a manner that will not be disruptive to the overall economy.

I would like to elaborate on a few of the points raised by Mr. Walker in his testimony. Let me cite a few examples of how S. 3006 would assist my company and the aluminum industry in accelerating energy conservation.

Like all extractive industries, the production of aluminum requires large quantities of energy and large sums of investment capital. Heavy capital demands and debt equity limitations have meant that companies like Kaiser Aluminum must carefully ration capital to those projects which are most essential to the continued growth and efficient operation of the business. As energy prices have skyrocketed and shortages have developed, we have found ourselves with a whole new set of capital requirements. Old plants need to be made energy efficient, new energy technology must be developed and conversions must be made from scarce to abundant fuels. In a few short years energy has imposed a whole new set of capital priorities. Hundreds of millions of new capital dollars are going to be required to complete the job. In our company alone, Kaiser has an energy investment plan which will accomplish all these objectives, but the earliest we can complete the projects we have identified will be almost to the year 2000. The plan does not require major breakthroughs in energy technology. We know what to do and how to do it. The greatest problems are working out the capital and engineering priorities and insuring that energy will be available once we complete the projects. S. 3006 would be a tremendous help in overcoming these problems.

One example of a project that could be implemented with the assistance of S. 3006 is the modernization of an aluminum smelter. In the smelting process raw materials are converted electrochemically into pure aluminum. Over the years smelter energy technology has steadily improved. The latest smelters are now nearly 25 percent more energy efficient than the current operating average in the industry. Substantial savings can be realized if the new technology is installed in the older plants. For example, one of Kaiser Aluminum's U.S. smelters could be modified in a five to eight year period with an energy savings of over 100 megawatts of electric power at existing production levels. Such savings would be equivalent to about 10 percent of a large new thermal powerplant. The modification would consist of alterations to, or replacements of, hundreds of individual aluminum reduction cells. Substantial changes to associated equipment would also be required. The cost of modifying a smelter will run into several hundred million dollars. S. 3006 would greatly enhance the prospects for completion of this type of project in the 1980's.

Kaiser is also working to improve the energy efficiency of its two alumina refining plants. We have initiated the first phase of an energy efficiency program in one

of these plants at a capital cost of $154 million. With no change in production level, this project will save nearly five trillion Btu's of energy annually, that is equivalent to 800,000 barrels of oil per year. The extensive capital required for such a project means that other energy related investments will necessarily be deferred without financial incentives of the type provided by S. 3006. These are two examples of large conservation projects where legislation embodying the concepts of S. 3006 would significantly accelerate energy conservation. There are many smaller projects that S. 3006 would also stimulate, but they cannot be precisely identified at this time because our capital planning is only beginning to contemplate the impact of stronger conservation incentives.

We applaud the leadership of Senator Wallop and the other Members of the Senate and House in developing legislation for a cost effective industrial energy conservation program. This approach should be used to bridge the gap between now and the era of synthetic fuels and other new energy technology. We strongly recommend that this legislation be enacted at the earliest possible date.

Senator BRADLEY. I have several questions I would like to get into.

Did you hear the testimony of the witness from the Treasury Department?

Mr. WALKER. Yes.

Senator BRADLEY. I missed it. So if I am duplicating or asking similar questions or raising similar points, I hope you will answer them.

As Senator Wallop knows, this is an issue about which I feel very strongly and which I waged a real battle over during the last year on the idea of residential conservation. I think that there is significant potential for displacing insecure foreign oil if it is done the right way. There are a lot of complexities in this area that really should be identified.

I would like to go not to the concept but to its application; in particular how you define the savings and output which determine what you are actually going to get in the way of a tax credit.

I wonder if you were at all troubled that in the bill there is no definition of either "output" or "savings"?

Mr. WALKER. Let me respond in a general sense and ask Mr. Wishart and other members of the panel to respond in more specifics, given their vantage point and expertise.

The first point about the administration of regulations, criticized by the Treasury Department representative, is that the only new thing required to administer this proposal is Btu equivalent saving. That is where the saving is measured. Companies report this anyway. The data are available, so this is relatively simple from that point of view.

Second, with respect to the problem of the complications in defining "output" and things of that kind, we are convinced—and I think my associates here will confirm it—that fully 90 percent of the cases involved will be very simple cases. The difficult ones to work out may require more thought, but we think they can be worked out.

Third, it is true that the administration, unfortunately, when something of this type is brought up, which will cost a small amount of revenue, tends to look at the difficulty. This is not nearly so difficult to administer as the industrial use tax would have been with its great complexity. This is only a real problem with respect to 5 or 10 percent of the issues.

I would like to ask Mr. Wishart or any others to make comments.

STATEMENT OF R. S. WISHART, JR., DIRECTOR, ENERGY AND TRANSPORTATION POLICY; ENERGY SUPPLY AND SERVICES, UNION CARBIDE CORP.

Mr. WISHART. Senator Bradley, I really can't feel that this problem of measuring productivity and output is as intransigent as the representative of the Treasury would say.

Senator BRADLEY. What I am concerned about measuring is the savings that result from a specific investment. The tax credit is contingent upon being able to measure savings and output, that is energy savings, not productivity.

Mr. WISHART. Since 1974 there have been in being reporting systems by various companies through their trade associations to the Department of Energy on energy savings. This is widely publicized, Senator Bradley.

It was not required under law originally; it was a voluntary program in 1974. I think it was then included in law because the requirements to report have been extended to companies in the 10 top SIC. categories. The point is that we have hammered out, and the Department of Energy has issued, regulations defining the reporting mechanism. We have done it since 1974. When it is said that industry is saving today 20 percent, or using 20 percent less energy per unit of output, that is based on that data.

Now, the principal amounts of energy used in the country are in the major process industries, the top five or so. There the question of Btu's per unit of output is very simple because you know how many Btu's you are putting in; you know how many tons of steel or pounds of chemicals you are putting out.

The question of what you do with automobiles, raised by the Treasury witness, is one that I think may be the motor vehicle association could answer, because I think they are reporting in some unit terms. Whether they are or not, I would suggest it is a de minimis problem because in the automobile industry the vast majority of the energy consumed is in the materials they buy—the aluminum, plastic and steel—they put in the cars, not in the processing to make the auto.

Senator BRADLEY. Do you think there should be a time period before qualification for the credit? In other words, do you think that you should have to show that investment had saved an average amount of energy over a 3- or 4-year period, or do you think it should be 1 year?

Mr. WISHART. Any scheme you use will create some problems, depending on all kinds of things. I think that can be worked out.

There is a test of your proposal, I think, in the proposed legislation.

Mr. WALKER. I think this legislation contemplates that the taxpayer would claim the credit in the next tax return like the regular tax credit. They will bear the risk if they don't show the energy saving.

Senator BRADLEY. We are talking about their bearing the risk of those data, which are now sent to the Department of Energy, actually getting to the Internal Revenue Service and the Internal Revenue Service actually going out and checking enough people to throw the fear of God into them, so that they only report what they have actually saved.

My point is not the broad administrative one so much as how to refine this legislation. I want this to happen. I want to refine it so that it can stand up under the light that will be shed on this issue in the course of the legislative process. If you say you are going to do it in 1 year, and I know that is what the legislation says now, there will be all kinds of arguments such as: Well, the reason there was decreased energy consumption is because we were in a recession or because we had a light winter the previous year. There are 15 or 16 variables that you have to consider when you are measuring savings. Therefore, the question is, what is the time period you think is appropriate for obtaining accurate measurement?

I frankly think 1 year does not provide sufficient data on which to base this judgment. Maybe you can argue convincingly that it is.

Mr. WALKER. I thought your question had to do with the time that the taxpayer would get the credit. If they had to wait several years to get the actual credit against their taxes, that would in effect kill the program.

Senator BRADLEY. You think it would kill the program?

Mr. WALKER. It would very much diminish it.

Senator BRADLEY. Let's assume I am going to make an investment based on what I think my costs will be and what the credit will be. The problem is that I don't know what that credit will be because I don't know what the energy savings are going to be. If the time period for measuring savings is over 3 to 5 years, I am going to make a big investment in a new plant like Lone Star Steel or some other process, and then I have this ax over my head that will be administered by DOE, not the Internal Revenue Service. That ax is going to fall 3 years out.

You thought you had a good investment, but suddenly you don't have a good investment because your savings have not been as much as you thought they would be. Therefore, what is the incentive to invest?

Mr. WISHART. It seems to me the company takes a risk there, but it is not in kind or in scope very different than if there were no incentive. It is putting up 70 percent of the money, so it has to have a pretty high level of confidence that this is a sensible thing to do.

Furthermore, I think because the problem in the kind of industry I work in is not lack of a high rate of return from such investments, but lack of money to invest in these high rate of return investments, the majority of them will be very much toward the lower limit. As a matter of fact, we suggest that the lower limit is not a good idea.

Senator BRADLEY. Lower limit?

Mr. WISHART. The $11 lower limit is not a good idea because it does not recognize the fundamental problem of lack of cash flow.

STATEMENT OF RICHARD B. POOL, ASSOCIATE DIRECTOR/ ENERGY, KAISER ALUMINUM & CHEMICAL CORP.

Mr. POOL. If I might add to that, every time an energy project comes up for board approval, it lists a capital investment and associated energy savings, and that, in our analysis, would form the basis for our claiming a credit.

Now, the company runs the risk, of course, that the energy savings won't come true. Not only does it lose the credit from the Government, but it also loses a tremendous sum of money because the project did not pay out. We would anticipate the credit would be initially applied on the basis of estimates.

Also, we feel very strongly that for the incentive value the credit needs to come up front as the investment is made. That is what is going to cause significant shifts in board rooms of companies like you have represented here.

Senator BRADLEY. When you see the credit up front?

Mr. POOL. Yes, to be able to take that credit on the basis of an estimate.

Senator BRADLEY. Let me ask the man from Owens-Illinois—under the windfall profits tax we have a 40-percent credit on solar energy. Do you think that will make a significant difference today in decisions that Owens-Illinois makes about the production and marketing of solar equipment?

Mr. JUNK. It will be if you are targeting the homeowner; it won't be if it is targeted at the industrial user. The 40 percent is not targeted to the industrial users.

Senator BRADLEY. What are the dynamics of your planning process? Say this law passes and you have a 20-percent credit, you don't know whether you will be able to keep that credit because the savings are measured over time?

Mr. JUNK. I support the position the companies are taking the risk. We are taking a risk by being in the business. In this case, it is the business of solar. We are investing money in that today. I believe that by having more clarity aimed at the industrial user that the industrial buyer as well as the industrial seller will evaluate, as he just said, the risk/rewards, so that it is not very difficult to make that decision by seeing the cost competitiveness of solar and conservation, whatever this is, the natural decision processes will occur.

You need the money up front. At a 15 percent inflation rate in 5 years, that 20-percent credit, if it is claimed then, is really a 10-percent credit. It needs to be up front and needs to stand the test of time. Buyers and sellers are ready to take those risks today.

Senator BRADLEY. I think you are saying the same thing that this other gentleman said, that even if the savings were measured 3 years out and your credit were disallowed, that you are putting up 70 percent of the money anyway and therefore you are going to make the investment, which raises the question then, why do you need the credit at all?

If you don't know that you are going to get the benefit of the credit 3 years out and you are going to make a 70-percent investment anyway, how does the credit figure into your decisionmaking process?

Mr. WALKER. I need the credit to speed these investments up in time. The technology is there; it is waiting to be used. With the shortage of capital in general, other competitive investments are such it is pushed back in time. Another 20 percent makes a considerable difference in that decisionmaking.

If we are going to get through the 1980's to the 1990's, we are going to need more than what is on the books right now to speed up worthy projects.

Senator BRADLEY. But you are not sure you are going to get it, because the savings are measured over a longer period of time and after you have taken your tax credit.

Mr. WISHART. When I made the point about the fact of the companies putting up most of the money, I was trying to illustrate that the company is taking most of the risk; therefore its confidence level that the saving would occur should be very high. It is testing the proposed investment before the money is spent by a capital budget procedure which enables its management to evaluate this investment versus others; therefore, the output of that process in the industrial company would be a high level of confidence that the investment would indeed qualify.

Senator BRADLEY. That was my argument with my residential energy efficiency plan, as Senator Wallop knows. The question of how do you know what the savings are really going to be resulted in a lot of reporting mechanisms that I am sure you gentlemen at the table have not even contemplated to date. I suppose as this legislation moves along the legislative path here, the question is going to be raised whether the regulatory mechanisms that are put in place and the requirements that are put on industry in order to assure that the savings are really the amount that the public would like to have are going to be worth that 20-percent investment tax credit.

Mr. WALKER. I will ask Mr. Clay A. Poole of Owens-Corning to comment on that point.

Let me say that there is a great difference in comparison between estimates of savings in residential operations as opposed to industry where these people have to put their reputation and expertise on the line to do it. They are the ones that make these estimates to convince the board of directors.

STATEMENT OF CLAY A. POOLE, VICE PRESIDENT OF ENGINEERING SERVICES, OWENS-CORNING FIBERGLAS CORP.

Mr. POOLE. Most of us are not going to make high capital investments in process modifications without doing prototype work. If you have done such an amount of prototype work, you will base your judgment primarily on that. So it would tend to reduce the risk projecting in the future.

Mr. JUNK. There might be one point. I think our common thrust in the 20 percent is to do it now. When oil is $127 a barrel in 1990, a different decision process may well occur. I think we are talking about doing things today in a joint effort that will occur in 1981, not in 1991. The investment tax credits or efforts like we are talking about here are trying to accelerate that process so that we can go to the boards and recommend an economical investment today, when oil is what oil and natural gas cost, as opposed to waiting until it is $127. It will occur naturally but it may be in the 1990's or the year 2000.

Senator BRADLEY. I have a number of other questions, but I know Senator Wallop, the father of this legislation, should be given full time.

Senator WALLOP. Thank you, Mr. Chairman.

May I also thank you for your perceptive and probing questions, because the idea of this hearing is to get the process started. Nobody thinks that within the next 3 days we will be able to get this through the Congress. There are difficulties involved. All of us who have been working with it realize it is a different bill than it was a year ago. It will be a different bill in the next session of Congress.

Frankly, if there are any more fun and games in the Middle East that $127 may be here before we get the legislation drafted. I am sure all of us hope that is not going to be the case. There is still some time and breathing room, and what we want to do is increase our self-efficiency and increase our ability to fulfill our international commitments under the sharing plan that has been agreed to by us which will cause severe problems in the American economy if they should happen to take place.

Dr. Walker, you have said that based on your experience in Treasury that this is probably administratable in at least 90 percent of the cases. With those other 10 percent is it your opinion that there should be a narrow, carefully crafted legislative definition of "output"?

Mr. WALKER. Senator Wallop, this has been under discussion in our group, by the experts. Again, I would like Mr. Wishart to respond to that, if he would.

Mr. WISHART. I will simply repeat the comments I made in response to Senator Bradley's question; that is, the bulk of the energy consumption by industry in this country is reported on through the industry associations.

These reports to the industry associations under section 375 of the Energy Policy and Conservation Act, requires that the data be available for audit on an individual company basis and I think the responsible firms are quite conscious of that fact. Even though the reports going to the Department of Energy are generally through the industry en masse, some are by individual companies; that option is open and every company has the data in its files to be available if audit is requested.

Second, each industry has a different set of parameters which are characteristic of the process. I think that makes sense because all kinds of human actions are involved; each of these industries has worked out a reporting procedure. I know under my direction a group in the chemical industry worked out a system which was accepted by DOE, and I think the one they preferred generally.

The aluminum industry under Mr. Pool did the same kind of thing. I don't know what they did specifically, but it was different. Each of these reporting systems defines internally a method of measuring the energy used and the change in energy used, and the output, so that they can divide one by the other and come up with an index.

Senator WALLOP. What about the concern that Mr. Sunley expressed, that Chrysler has been making Imperials and is now making K cars; unit of output is different. Is there an industry response to the charge that Treasury could not be expected to responsibly measure those differences?

Mr. WALKER. First of all, as Mr. Wishart noted, in the production of automobiles a vast amount of energy is expended before you get to the point that Mr. Sunley was talking about, in the casting and so forth of the various metals.

The second and the fundamental point is that if it is true, as we believe, that in 90 or 95 percent of the cases there are going to be no arguments, IRS can come in there and do the audit and there will be no problem, it will be a pity to say this legislation should be killed, because that extra 5 to 8 to 10 percent involves some sort of problem.

We want to hold down the administrative complexity. The legislative intent and the record will show very clearly where the Treasury should go to get this thing, if it were to pass next June, on the books and moving because it is so urgent. There should not be any question about that 90 to 95 percent.

On the other 5 to 10 percent, you might well have an administrative approach where the companies would have to demonstrate in effect that the savings were there, subject to the satisfaction of the Internal Revenue Service and Treasury consulting with DOE.

Mr. POOL. I will just say with the Btu-per-pound measurement, I think the problem can be handled. Certainly you are not going to measure Chrysler full-size cars against K cars, like today we don't measure aluminum cans the same way we measure aluminum castings for wheels.

The system in our company is already set up, and I suspect—in fact, I am sure—with all companies across the country, particularly the heavy process industries, whereby the energy use per unit of output is measured for each different product line—where products are significantly different in its energy content—I don't see this as an insurmountable problem.

DOE has been very much involved with the industry groups in measuring energy conservation; so far the Treasury Department has not.

Senator WALLOP. Do you agree that the credit should be dropped for replacement property?

Mr. POOL. I would think this should be a subject of careful study. In some instances replacement property is going to substitute for existing property and create a very substantial energy savings. I would not think at this point in time it would be appropriate to say that replacement property should simply be struck from any consideration. I think it needs more study.

Mr. JUNK. In listening to the gentleman from the Treasury Department's testimony, I was intrigued with the example of when the furnace goes out you have to do something about it. The question I see with replacement property is that we are talking not in black and white kind of situations where the furnace is out or the property has to be replaced, but where opportunities are presented for making substitutions of property that may well be old and marginal but still quite operative, and I think that that is why I would suggest careful study of that, because I don't believe replacement property in most industrial cases is going to be a black and white issue, as the lady whose furnace is not working on Christmas Day.

Senator WALLOP. Dr. Walker, you indicated in your testimony and others have expressed concern about the $11 floor that in some opinions, yours and others, might prevent certain valuable projects from going forward. You no doubt understand the concern that I have, that we do not want to give a tax credit to projects that are already economically viable, but if you or any other member of the panel could suggest some mechanism that would guarantee the taxpayers' money is used wisely in promoting industrial energy conservation, is there some idea that maybe a phasein of the $11 floor is the answer, or is there some mechanism that you can think of which will assure that the basic purpose of the bill is not to fund projects that are already economically viable?

Mr. WALKER. Let me make a couple of comments in a general sense, and also the specific sense that I think Mr. Sunley was referring to.

We have, of course, the investment tax credit in general, which is a widely accepted and hearalded portion of our tax law now. Undoubtedly, some, if not a very large part, of the investments made today would be made without the existence of the investment tax credit.

What we are talking about is basically a speeding up operation. There you have to recognize that even though something on paper looks like it is very, very good in terms of a rate of return, something for energy conservation, when you know what the company has to spend for regulatory purposes, what they have to spend for marketing, what they have to spend for basic replacement of plant, that a very profitable looking energy conservation investment can be shunted down even though on paper it looks like it is something that would be done tomorrow.

I think perhaps the biggest aspect of the $11 floor, the biggest negative aspect that we see, is this: Suppose you have an investment that gives you a barrel of oil equivalent saving and the credit turns out to be $3, that is an awfully big bang for the buck foregone by the Treasury Department, even though you could make the argument it would be done in 1986, 1987, or 1988. Getting an extra barrel of oil produced very soon for only $2 or $3 or $4 a barrel, we think, is a very, very strong point.

With respect to Mr. Sunley's statement about the "gold plate," as you properly pointed out in your questioning, elimination of the $11 limit would get around that particular problem.

Do any of you gentlemen want to add to our concern with the $11 floor? What about your company and companies in general, would this make a difference?

Mr. JUNK. I would point out in the last strategic planning cycle at Owens-Illinois, our front line managers in the operating divisions were able to justify—and these are people putting their careers on the line, calls for capital that was over five times the available capital. That is the real situation. I think you find it the same in most of the companies sitting at this table. Just because you have a project that has a rate of return over 15 or 20 percent does not mean it is going to be funded; the capital is not available.

Senator WALLOP. It is your opinion, then, that this would move that decision well up in competition with the other capital demands that occur?

Mr. JUNK. Yes, I do, especially if you consider the lower end, where the ones are that we are trying to say would be made anyway. You seriously consider—and I am sure companies here would be glad to respond later with more detail—those as the ones you assume will be made. But when calls for capital are three to four times the available capital resources there are a lot of investments that will not be made. I think it would do a lot for those.

Senator WALLOP. Mr. Chairman, we have a vote.

Mr. WISHART. Senator, I would like to comment a little further on that. I put some thoughts together which your aide has picked up, so I am referring to those.

I could not emphasize more strongly the fact that I think the problem is lack of cash flow and lack of a means of directing capital to the particular targeted investment. That is far more germane than concern about whether such investment may not be attractive.

I think the other part of it is—and what really brought this group together originally—the recognition that we had an asymmetrical national policy. We were subsidizing or encouraging synthetic fuel projects which will come on in 10 years which will cost two and a half times as much as the oil production investment will.

It seems to me very appropriate that we also encourage energy conservation investment which could cost half as much and be functioning within a year.

Our problem is not only the long term but also the short term in terms of imported energy dependency.

With that as a background, we could suggest that there be no lower limit or a $1 lower limit for a period of, say, up through 1985, so that investments made before that time would have no lower limit on the return; after that point in time, go back to the $11 or whatever.

The point of the $1 is that simply it would be a clear warning to the companies involved that for poor investments of this kind, qualifying this sort of tax credit they have to have a separate category of justification that the energy claimed saved was indeed saved. They have to have records for it.

Senator BRADLEY. I think we have a vote in 5 minutes. I think what we will do is recess the committee for 10 minutes, and we will be back in 10 minutes. At that time we will go to the next panel.

I would like to thank you gentlemen for your testimony. I have found it helpful.

[Brief recess.]

Senator WALLOP. The hearing will resume.

Next is a panel consisting of Mr. William Sessions, vice president, energy and chemicals technology, American Can Co., representing the National Association of Manufacturers; and Mr. James Law, chairman, marketing committee, Thermal Insulation Manufacturers Association.

Gentlemen, you may proceed as you wish.

STATEMENT OF L. W. SESSIONS, VICE PRESIDENT, ENERGY AND CHEMICALS TECHNOLOGY, AMERICAN CAN CO., ON BEHALF OF THE NATIONAL ASSOCIATION OF MANUFACTURERS

Mr. SESSIONS. Thank you, Mr. Chairman.

My name is L. W. Sessions. I am vice president, energy and chemicals technology, American Can Co. I am here today representing the National Association of Manufacturers, the NAM.

The NAM represents over 12,000 companies which employ a majority of the country's industrial labor force and which produce over 75 percent of the Nation's manufactured goods.

In presenting my oral statement, I am also requesting that the record include the written statement which NAM filed with the committee last Friday.

Senator WALLOP. It will be so ordered, without objection.

Mr. SESSIONS. Thank you, Mr. Chairman.

[Prepared statement of NAM follows:]

Statement of the National Association of Manufacturers
on the
Industrial Energy Efficiency and Fuel Conversion
Tax Incentive Act of 1980, S. 3006
before the
Senate Finance Taxation and Debt Management Subcommittee
September 29, 1980

Introduction

The National Association of Manufacturers (NAM) appreciates the opportunity to present a statement in support of S. 3006, the Industrial Energy Efficiency and Fuel Conversion Tax Incentives Act of 1980. The NAM represents over 12,000 companies which employ a majority of the country's industrial labor force and which produce over 75 percent of the nation's manufactured goods. Over 80 percent of NAM member companies are generally classified as small businesses. The Association is also affiliated with an additional 158,000 businesses through the National Industrial Council and NAM's Associations' Department.

The Importance of Energy Conservation

Energy conservation, which we take to mean the more efficient use of energy, is one of the most powerful means available to our nation to reduce its excessive dependence on imported oil. Investments in energy conservation are usually low risk, often produce immediate results and are counter-inflationary because they improve productivity. Thus, improvement in energy conservation must be a fundamental part of any balanced national energy policy.

The NAM strongly believes that, in the long run, the most effective way to encourage energy conservation is through the free market system whereby market clearing prices on energy will stimulate its most efficient use.

Although higher energy prices clearly will stimulate conservation in the long run, the thrust of this hearing today and the purpose of S. 3006, Industrial Energy Efficiency and Fuels Conversion Act of 1980, is to provide an incentive for energy conservation in the short run. The NAM believes that short-term stimulation of energy conservation is desirable for two fundamental reasons. First, government price controls on natural gas and oil have held prices of these natural resources below market levels.

This disincentive had delayed conservation investment and created a backlog of projects which are just now becoming economically justifiable in light of today's energy costs. Secondly, our dependence on foreign energy supplies is imposing a serious financial and political burden on our nation. The adverse impact on national security, should be addressed at a faster pace than market economics for individual projects would otherwise provide.

II. Industrial Energy Profile

The industrial sector represents a major target for significant reduction in national energy use, and should be particularly responsive to incentives proposed in Senator Wallop's bill. Industry currently consumes about 36 percent of the nation's energy, most of which is oil and natural gas. Since the oil embargo of 1973, the industrial sector has led all of the sectors of the economy in improving the productivity of energy use. In 1979, industrial production increased by 17 percent over 1973, and yet total industrial energy use just barely increased. Net improvement in industrial energy efficiency exceeded 14 percent. According to a recent study, this improvement has amounted to 61 percent of the nation's overall energy efficiency improvements during this period.

Energy management has become institutionalized within the corporate sector. A recent survey showed that 85 percent of the Fortune 500 companies have formalized energy conservation programs. Increasingly, energy costs are being managed just as stringently as other major production costs.

Despite improvements already made in industrial energy productivity, there is still much that can, and should, be done. Many of our industrial plants are less energy efficient than presently desirable because they were constructed in an era of very inexpensive energy. Retrofitting, or replacing these plants, will require heavy capital investment. This investment will gradually occur driven by higher energy prices. However, it is our belief that the national interest requires a short-term stimulation of this investment through incentives which are consistent with, and supplementary to, normal market forces.

The basic problem facing individual companies in improving energy efficiency is cash flow. Typically, there are a greater number of desirable alternative opportunities for capital investment than there are company cash resources can support. In these circumstances, energy conservation investments are likely to suffer. They may be pushed down in the scale of priority because they are often deferable in the short term, and they may not be as attractive as corporate investments which improve existing product lines

or create new business opportunities. However, an important question of public policy is: How can energy productivity investment opportunities be given a favorable bias while leaving the decision on which investment to make within the private sector and individual firm?

IV. Government Industrial Productivity Incentives

Two elements of tax policy with powerful effects on industrial capital investment are depreciation rules and the investment tax credit. The NAM strongly endorses the specific provisions of the Capital Cost Recovery Act, "10-5-3". This legislation, if enacted, would allow for a more rapid recovery of investments in plants and equipment thereby providing some of the funds needed for investments in new structures and equipment, including more energy efficient assets. Such a measure, we believe, is essential to modernize our nation's industrial production base. Broad-based capital formation legislation is NAM's top tax legislative priority.

Experience with investment tax credits since initial passage in 1962 has shown this mechanism to be effective in stimulating capital investment. The House Ways and Means Committee stated in House Report 95-1445 that "investments have increased when the credit has been made available and decreased when the credit was rescinded." One of our member companies reviewed their experience with investment tax credits. They confirm that capital expenditures increased in the years following the original enactment in 1962, and again picked up after restoration of the credit in '71 and in the years following when the ITC was raised to the 10% level.

The cement industry also provides a specific example of the potential energy-savings if eligibility requirements of the Energy Tax Act of 1978 are expanded. The cement industry has enormous potential for conserving large amounts of energy by installing more energy-efficient equipment, particularly the conversion from the wet to the dry process. Under the wet process, raw materials are mixed with water as part of the fine grinding process that prepares the materials for firing in the kiln. Inside the kiln, large quantities of fuel are burned to drive off the water and calcine the raw materials. Under the dry process, however, raw materials are introduced into the cement kiln in a dry state. Kiln fuel consumption is less because there is no water to be removed before the calcining action can begin.

As of December 31, 1978, about 47.4 million tons or 53 percent of U.S. industry capacity utilized wet process kilns. The average wet process plant required 6.2 million

Btu's per ton of production in 1978. This represents fossil fuel requirements. In 1978 the wet process plants operating at capacity would have required about 295 trillion Btu's. If these plants had been using more fuel-efficient dry process technology, their total energy usage would have been cut to about 150 trillion Btu's. This saving is equivalent to 24 million barrels of oil each year, enough to fuel over one million automobiles.

Because the cement industry, like most industries, faces a capital need substantially higher than its total net worth, a serious problem exists related to the enormous costs of adopting energy-efficient technology. One cement company estimates it would have to spend $300 million to modernize and convert three of its plants to this preheater/precalciner dry process. In a basic commodity industry that requires very high investment for a historically low rate of return, the additional tax incentives that would be provided in Senator Wallop's bill would clearly help stimulate timely capital investments in this technology that would save significant amounts of energy.

The investment tax credit mechanism was extended for certain energy conservation activities under the Energy Tax Act of 1978, and the Crude Oil Windfall Profit Tax of 1980. Unfortunately, the Energy Tax Act limited the credits to certain specified energy properties subject to interpreted regulations by the Treasury Department. These regulations were long delayed, appearing just last week in proposed form. As feared, they are severely restrictive. It appears that, at least, the Congressional intent to encourage industrial energy conservation under the Energy Tax Act will be very narrowly construed.

In addition to listed items, the Energy Tax Act also provided for "any other property of a kind specified by the Secretary (of the Treasury) by regulations, the principal purpose of which is reducing the amount of energy consumed. . ." In the newly issued regulations, the Treasury Department chose not to implement the "any other property" section of the Act.

The Windfall Profits Tax provided certain standards for the exercise of the Treasury's authority, but the conferees directed the Treasury Department to be certain that the resulting reduction in oil imports is large enough to justify the subsequent loss of Treasury revenue, and that the credits would not result in wasteful investments. Reconciliation of these directives will be difficult, if not impossible, to achieve.

V. The NAM Position

After reviewing a number of other initiatives designed to increase the efficient use of energy in the industrial sector, the NAM Board of Directors passed a resolution on May 12, 1980, which supports a non-refundable additional tax credit aimed at stimulating industrial energy conservation and production. Such credit must be limited in duration and available for broad types of equipment and industry in general, and limited in dollar amount to 15 percent of the Crude Oil Windfall Profits Tax to be set aside for such purposes.

The NAM supports tax credits because their use has proved effective in the past. They are less cumbersome to administer than other approaches (such as grants), and if broadly based, they need not unduly interfere with normal corporate decision-making.

VI. The Wallop Bill (S. 3006)

The NAM supports the general thrust of the Industrial Energy Efficiency and Fuel Conversion Tax Incentives Act of 1980 as introduced by Senator Malcolm Wallop. We believe industry will aggressively respond to the stimulation contemplated in the legislation, particularly if Congress clearly expresses this as a declaration of national energy policy.

This measure, if enacted, will effectively extend and clarify the definition of types of property to qualify for the proposed additional 20 percent investment tax credit. Moreover, Senator Wallop's new category of energy property called "qualified industrial energy property" would stimulate a broad class of industrial energy efficiency investment.

How effective would this bill be in accelerating major industrial energy conservation projects? Once again, one of our member companies assessed its impact with relation to some specific projects which are under consideration but which are now "on hold." One such project is a replacement boiler at a mill to produce processed steam using wood, production wastes and mill sludges as fuel. Under current conditions, the return is marginal, and they would defer the investment for at least five years. But, under the Wallop bill, the internal rate of return would nearly double, which would unquestionably accelerate this investment. Incidentally, this company also reports that they have just undertaken a major energy savings investment in Canada, in response to credits allowed by the Ontario government to stimulate construction.

There is one major provision in this bill (S. 3006) which concerns us and that is the denial of investment credit when each barrel of oil equivalent saved by the otherwise qualifying investment is $11 or less. Questions have been raised as to whether incentives are necessary for investments at this level.

NAM believes the important point is for as many energy efficient investments to be moved forward as possible. The more efficient they are, the less cost to the Treasury to encourage them. Establishing a "floor" under this credit would needlessly complicate the legislation and could result in the anomalous situation of a company endeavoring to reduce the calculated efficiency of an investment in order to qualify for the credit. Also, it must be kept in mind that in all cases for which the credit is allowed, industry will supply at least 70 percent of the capital cost.

On the other hand, we believe the upper limit of $55 (or a figure comparable with the cost of energy from "alternate" sources) is justified. Energy conservation should not be subsidized to the extent that it is more costly than synthetic fuels.

VII. Conclusion

In the context of increasing uncertainty surrounding the price and supply of foreign petroleum, most recently demonstrated by the Iraq/Iran conflict, and the national imperative to accelerate an improvement in energy productivity, NAM supports Senator Wallop's investment tax credit approach. A major suggestion to improve the bill would be to remove the $11 BOE credit limitation. But we concur that the investment tax credit approach would minimize the government's involvement in the business decision-making process, and minimize the cost to government while, at the same time, maximize potential energy savings.

Since the industrial sector uses more than one-third of the nation's energy, the potential for energy productivity savings is large. But, for a variety of reasons, industrial energy saving investments are often deferred in preference to other investments. Therefore, the NAM feels that it is appropriate public policy, as set forth in Senator Wallop's proposed legislation, to provide incentives for industry to pursue and accelerate energy efficiency investments which otherwise might not be made or would be substantially delayed.

Thank you.

Mr. SESSIONS. We are constantly reminded, most recently with the outbreak of war between Iraq and Iran, of our Nation's dependence and vulnerability to interruptions of foreign supply and energy. Energy conservation is one of the most powerful means available to our Nation to reduce this dependency. Investments in energy conservation are usually low risk, often produce immediate results and are counterinflationary because they improve productivity.

Improvement in energy conservation must be a fundamental part of any balanced national energy policy. While we believe that in the long run the most effective way to encourage energy conservation is through the free market system whereby market clearing prices on energy will stimulate its most effective use, we nonetheless strongly support and encourage adoption of short-term incentives which will stimulate and accelerate investment in industrial energy conservation.

The industrial sector consumes about 36 percent of the Nation's energy, most of which is oil and natural gas. Since 1973, the industrial sector has responded to higher energy prices and uncertain supplies by improving energy efficiency by more than 14 percent.

Despite this improvement, there still is much that can and should be done. Many of our industrial plants are less energy efficient than is presently desirable because they were constructed in an era of inexpensive energy. Retrofitting or replacing these plants and processes will require heavy capital investment. This investment will gradually occur, driven by higher energy prices. However, the basic problem facing individual companies in making investments to improve energy efficiency today is cash flow.

Typically, there are a greater number of opportunities for capital investment than there are company cash resources to support them. In these circumstances, energy conservation investments suffer in the near term because they are often deferred for more attractive investment in improvements in existing product lines or to create new business opportunities.

Two elements of tax policy with powerful effects on industrial capital investment are depreciation rules and the investment tax credit.

The NAM strongly endorses the specific provisions of the Capital Cost Recovery Act, 10-5-3. This legislation, if enacted, would allow for a more rapid recovery of investment in plants and equipment, thereby providing some of the funds needed for investment in new structures and equipment, including more energy efficient assets. Experience with investment tax credits since the initial passage in 1962 has shown this mechanism also to be effective in stimulating capital investment.

In preparing my testimony today, I reviewed my own company's experiences with investment tax credits. I can confirm that our own capital expenditures increased in the years following the original enactment in 1962, again picked up after reinstitution of the credit in 1971, and in the years following raising the ITC to the 10-percent level.

The investment tax credit mechanism was extended for certain energy conservation activities under the Energy Tax Act of 1978 and the Crude Oil Windfall Profit Tax of 1980.

Unfortunately, the Energy Tax Act limited the credits to regulations subject to interpretation by the Treasury Department. These regulations were long delayed, appearing just last week in proposed form. As feared, they appear to be severely restrictive.

It appears that the congressional intent to encourage industrial energy conservation under the Energy Tax Act will be very narrowly construed.

We also believe that the energy tax incentives under consideration today are consistent with and complementary to the needed overall tax priorities.

I attempted to assess the impact, Senator, of your bill in accelerating major industrial energy conservation projects in my own company in relation to several specific projects which have been proposed but which are now on hold because of current capital restrictions.

One such project is a replacement boiler at one of our mills to produce process steam using wood products' waste and mill sludges as fuel. Under current conditions, the return is marginal and we will defer this investment for at least 5 years.

Under your bill, the internal rate of return would double, which clearly would accelerate this investment. Incidentally, we have undertaken a major energy savings investment in Canada which was moved forward in response to credits allowed by the Ontario government to stimulate construction.

There is one provision in this bill which concerns us, and that is, the denial of the investment credit when each barrel of oil equivalent saved by the other qualifying investment is $11 or less. Questions have been raised as to whether incentives are necessary for investment at this level. The NAM believes the important point is for as many energy efficient investments to be moved forward as possible. The more efficient they are, the less cost to the Treasury to encourage them.

Establishing a floor under this credit would needlessly complicate the legislation and could result, as the Treasury pointed out this morning, in the anomalous situation of a company endeavoring to reduce the calculated efficiency of an investment in order to qualify for the credit. It must be kept in mind that in all cases for which the credit is applied, industry will supply at least 70 percent of the capital cost.

On the other hand, we believe the upper limit of $55 is justified. Energy conservation, in our opinion, should not be subsidized at a cost exceeding that of developing synthetic fuels.

To summarize, in the context of increasing uncertainties surrounding the price and supply of foreign petroleum and the national imperative to accelerate improvement in energy conservation and productivity, NAM supports your bill, S. 3006. We concur that the investment tax credit approach would minimize the Government involvement in the business decisionmaking process and minimize the cost to Government, while at the same time maximizing potential energy savings.

Since the industrial sector uses more than one-third of the Nation's energy, the potential for energy productivity savings is large, but for a variety of reasons, industrial energy savings investments are often deferred in preference to other investments. Therefore, the NAM feels it is appropriate public policy, as set forth in your proposed legislation, to provide incentives for industry to pursue and accelerate energy efficiency investment which otherwise might not be made or would be substantially delayed.

Thank you, Mr. Chairman.

Senator WALLOP. Thank you, Mr. Sessions.

Mr. Law?

STATEMENT OF JAMES LAW, CHAIRMAN, COMMERCIAL/INDUSTRIAL SYSTEMS COMMITTEE, THERMAL INSULATION MANUFACTURERS ASSOCIATION, TIMA, ACCOMPANIED BY GARY ACINAPURA, PROJECT DIRECTOR, STEAM PROCESS PIPING RESEARCH STUDY

Mr. LAW. My name is James Law, chairman of the commercial/industrial systems committee of TIMA.

TIMA is an association of manufacturers which produce insulation products for the commercial and industrial building markets.

With me today is Gary Acinapura, project director of a steam process piping TIMA research study which has brought into focus a major opportunity for substantial energy savings never before documented. The results of this study are remarkable and unique, since before it was completed this August no detailed data on insulation use by industry were available.

We did know that since 1973 pipe insulation thicknesses had gone up only one-quarter inch while fuel costs had quadrupled. We commissioned the study to find out where insulation was being used and what the potential was for our industry.

This first phase study examined the use of insulation for steam process piping which represents 42 percent of industry's total energy use. It covered 15 SIC categories accounting for 85 percent of industrial energy use. An energy-use data bank, accumulated over several years by General Energy Associates for FEA and DOE, served as the base for selecting the most energy-intensive industries. These were then surveyed to determine insulation use for steam process piping.

The respondents reported 325 million lineal feet of steam process piping in use, which is 62,000 miles of pipe, enough to circle the earth 2½ times, 72 million feet of which—13,500 miles—is uninsulated—no insulation at all—and the balance is underinsulated by today's standards. Insulation thickness of 1.7 inches on pipe sizes over 2 inch and 1 inch on size below 2 inches were reported as being used on these pipelines.

If these thicknesses were increased to economic thickness levels, industry could save 305,000 barrels of oil equivalent every day. That is 111 million barrels per year, or $2.5 billion, at $22.33 per barrel oil equivalent cost average.

In 10 years, over 1 billion barrels and $23 billion in constant 1980 dollars can be saved by just bringing insulation on steam process piping up to economic thicknesses.

We are currently in the process of proposing market research studies for tanks, equipment, and other piping which make up the remaining 58 percent of industrial energy use. Our conservative estimate at this time is that we will find energy saving potentials of roughly the same magnitude in this sector of industrial energy use.

Economic thickness of insulation, or ETI, simply stated, is that thickness which produces the lowest possible sum of the annual cost of energy and the annual cost of insulation; in other words, not too much insulation and not too little, just the exact amount to meet a financial or energy savings goal.

The ETI concept was first postulated in 1926 and until the time of computers was too difficult to calculate. TIMA took the concept, modernized it, programed and promoted it as a service to industry. These are the thicknesses used to project the savings I just described. Average conditions for the 15 industries in the study were taken—for fuel cost, depreciation, labor and material costs, degree of job complexity, fuel escalation costs, and many other critical computer inputs—in order to determine the economic thicknesses.

The economic thicknesses calculated for the steam process piping were 2 inch for small pipe sizes below 2 inch in diameter, and 3 inch for sizes above 2. This compares to 1 inch and 1.7 inches in use today.

Cost to insulate all the bare pipe and to replace existing insultion with more efficient insulation in economic thicknesses was also calculated. It is $6.2 billion, which includes material and labor at about a 40–60 ratio, respectively; $6.2 billion is a lot of money, but when compared to $2.3 billion annual savings in fuel cost the payback is only 30 months.

These are the highlights of the steam process piping insulation study and the projections we have made for dramatic savings in dollars and precious fuels; they are substantial and can be accomplished using existing materials and technology. The insulation industry has the technology and ability to supply materials so no time need be lost in building new plants now or creating new technology.

The only deterrent we foresee is that insulation will not in many instances qualify for the tax credits proposed in S. 3006. I am referring here to the minimum and maximum qualification limits in the bill.

For instance: One, if a lot of energy is saved for a relatively small investment, no credit will be allowed. This is the $11 minimum floor. To insulate bare piping, the savings are so great in relation to the cost that it will be less than the $11 floor.

Two, if a small amount of energy is saved from a large investment, only $55 per barrel oil equivalent will be allowed as a credit instead of 20 percent of the total cost. To wrap more insulation over existing insulation, the cost is generally high in relation to energy saved. It is in most cases over the $55 maximum.

TIMA is sure that the intention of S. 3006 is to encourage energy conservation and to help in those efforts by supplying incentives. It would seem counterproductive to the intention of the bill not to encourage the kinds of savings just presented when they are so easily obtainable.

We are also aware that the insulation study facts just presented were not available when S. 3006 was drafted. Savings of 305,000 barrels per day should certainly be considered more than housekeeping or more than sufficiently attractive, that they do not need to be incentivized.

History has shown that despite TIMA's promotional efforts and the efforts of the member companies, insulation thicknesses have only increased one-quarter inch since 1973, while fuel cost has quadrupled.

Thank you, Mr. Chairman.

Senator WALLOP. Thank you, Mr. Law.

I must say that while I find myself in some sympathy with the concern on the $11 minimum, I would be hard-pressed to write off the $55 maximum, since it still remains a viable option in this country and we have a rather substantial investment in seeing that those go ahead.

I do like some other concepts such as the phasing in the $11 floor, in other words, trying to realize the maximum benefits to the country early.

Mr. Sessions, I wonder if the NAM has given any thought, in addition to its energy savings that have been described by your other testimony, if these credits in any way help American industry with its world competitive industrial relationships? In other words, would it improve our competitive position? Could it improve our competitive position in regard to European, Japanese, Far Eastern manufacturers?

Mr. SESSIONS. Basically, the NAM favors this because we are convinced this measure will improve the energy productivity of our existing industrial plant. Anything which will improve that productivity should help us in the world competition for trade. Certainly, your bill is less costly than the supply initiative of synfuels.

Senator WALLOP. The point I am seeing in here is that it may make this more productive. What I would hope to see coming from it is that the cost of unit production as it relates to energy would be substantially less if you used substantially less energy.

One of the precise benefits that I would hope the public would realize when they are looking at this is not only encouraging the use of less energy but also increasing our ability to have our manufactured goods compete more economically, more competitively.

Mr. SESSIONS. In our opinion, there is no question about it. This is the primary reason we favor this bill, because it would accelerate a reduction in the unit energy cost in industry.

Senator WALLOP. Other than Canada, are you aware of any other country that is proceeding with this kind of incentive program for conservation of energy?

Mr. SESSIONS. Our direct experience with Canada stimulated a very substantial investment up there, on the order of $80 million. I believe that some European countries also do the same thing. I really don't want to go on the record and only conjecture on that.

Senator WALLOP. Has NAM taken a position on making the investment tax credit in S. 3006 refundable?

Mr. SESSIONS. This principle of an initiative to improve energy conservation is so important to the NAM that the board passed a

resolution in May 1980, supporting a nonrefundable additional tax credit to stimulate industrial energy conservation.

The board also took the position that this credit should be limited in duration, as it is in your bill, available for broad types of equipment and industry in general and limited in dollar amounts to 15 percent of the crude oil windfall profits tax to be set aside for this purpose.

The NAM in general disfavors refundability of tax credits on the basis that they could tend to skew investments toward reduced efficiency rather than increased efficiency.

Senator WALLOP. Mr. Law, there may be some concerns about the production capacity in the insulation industry. If you are running both to capacity, this tax incentive could drive up prices. In your opinion, does the insulation industry have the capacity to meet the demands that this tax incentive would create?

Mr. LAW. After 1973-74, after the last go-around, if you will, of energy problems, the insulation industry, in anticipation of a substantial increase in retrofitting requirements for insulation, did make sizable investments in capacity.

The crunch never really came, so that the insulation industry today still has quite a bit of unused capacity. So there would be capacity that could flex up with the demand.

Senator WALLOP. Your testimony also indicates that insulation is already a good investment for most industries. If it is such a good investment, why is this incentive necessary? I know you have testified that some people don't do it, even though it is a good incentive. Why would the credit hold?

Mr. LAW. I would support basically what some of the other witnesses have testified also, that in the capital crunch in industry insulation always seems to fall to the bottom. I speak for our own company for the same problem. Capital constraints are so high on other things that it will yield better productivity, new markets, et cetera, that they take the capital that is available before insulation does.

Another area that we in TIMA have come to find out in talking with industry as we have tried to upgrade thicknesses, is that as long as energy is available to industry, damn the cost, if you will, from the standpoint of what the cost per barrel of oil. Insulation starts to fall to the bottom side of the other things that are making the requests for capital.

Senator WALLOP. I obviously have more questions. Senator Bradley is on his way back. We have another vote. I think you might just wait until he comes back to see if he has any questions of you. Otherwise, he will call the next panelists.

I will recess the hearings for 10 minutes.

[Brief recess.]

Senator WALLOP. Senator Baker has just made the comment that we now have three filibusters on the continuing resolution. He calls it backed up like airplanes in bad weather. It is a little bit disconcerting to know what exactly will go on. I thank this panel very much.

Senator Bradley may have questions to submit by mail. If that is agreeable, it will be fine. In the interest of trying to complete the hearing we will move to the next panel.

Thank you both very much.

Mr. LAW. Thank you, Mr. Chairman.

Senator WALLOP. Next is a panel consisting of Frank Govan, vice president, World Energy Group, Combustion Equipment Associates, Inc., New York, N.Y., and James L. Barker, president, CSI Resource Systems Inc., Boston, Mass.

Gentlemen, welcome. Again I apologize for the herky-jerky nature of it but I guess that is inherent in the closing days of a session. Proceed in any way you wish.

[The following was received for the record:]

COMBUSTION EQUIPMENT ASSOCIATES, INC.,
New York, N.Y., October 3, 1980.

Mr. MICHAEL STERN,
Staff Director, Committee on Finance,
U.S. Senate, Washington, D.C.

DEAR MR. STEIN: I am submitting the following comments for the hearing record on S. 3006.

I am Carolyn S. Konheim, a representative of Combustion Equipment Associates, Inc. (CEA), whose Chairman of the Board, Robert M. Beningson filed a statement on S. 3006 on September 29, 1980. These are supplementary to those remarks and those of Francis S. Govan, Executive Vice President of CEA who testified before the Committee.

During the hearing, we heard the comments on S. 3006 by Mr. Sunley speaking for the Treasury Department and the Administration.

In order to clarify the basis for the opposition to the bill, I interviewed today (October 2, 1980) Moshe Schuldinger, Chief Counsel on Tax Legislation of the Department of the Treasury. His explanations illuminate the testimony of Mr. Sunley and suggests ways in which modifications to the bill might remedy the problems. His points were:

(1) Revenue loss is not the primary concern. It is certainly within the purview of Congress to determine government expenditures and revenues. However, Congress appear reluctant to acknowledge that a tax credit is no different than a government grant in the impact on the Federal Treasury. Therefore, the need for the subsidy should be decided on its merits and comply with equally rigorous criteria. Tax credits merely transfer program responsibilities from program agencies to Treasury and in doing so restrict the program agencies' jurisdiction over the program.

(2) The most serious problem in administrating the proposed tax credit is its lack of specificity. Without clearly defined criteria, the IRS agent, who has no expertise in energy, must ascertain compliance with a computation of energy savings. Too much judgment is required on the part of the IRS agent. A way of remedying this is to establish in the legislation a means by which the Department of Energy certifies compliance with a statutory standard of energy savings. Upon presentation of the certification to the Treasury, the tax credit is granted.

(3) The opposition to refundable tax credits grows out of the appreciation that tax credits are really a targeted spending program but not subject to the jurisdiction of Appropriations Committee. Logically, however, if a tax credit is the equivalant of a spending program, for a need recognized by the government, it should make no difference if the taxpayer had or did not have, a tax liability in that year.

It is my opinion that Treasury's concern about the administrative difficulties of the bill can be remedied by:

(1) Removing the $11.00 floor on value of barrels of oil equivalents saved.

(2) Giving an incremental tax credit according to savings.

(3) Requiring DOE to certify the savings achieved as a basis for award of the tax credit.

Sincerely,

CAROLYN KONHEIM,
Program Manager.

STATEMENT OF FRANK GOVAN, PRESIDENT, WORLD ENERGY GROUP, COMBUSTION EQUIPMENT ASSOCIATES, INC., NEW YORK, N.Y.

Mr. GOVAN. Thank you, Senator Wallop. My name is Frank Govan, president of the World Energy Group, Combustion Equipment Associates, Inc., a New York Stock Exchange-listed company.

We are here in support of Senate bill S. 3006 because since the early 1970's CEA has spent approximately $150 million in development of a proprietary process to convert municipal wastes to a fuel. We sell it at a cost substantially below the present cost of oil. At the present time our fuel, called Eco-Fuel, is replacing more than 50 percent of the oil used in one existing utility boiler at the United Illuminating powerplant in Bridgeport, Conn.

This garbage-to-fuel development has been totally financed through private investment with no government funds involved. As a small company it has been the equivalent of investing all the assets of our company. However, with the rapidly growing construction and development costs, it is now beyond the capability of a firm of our size to do a similar thing in the future with our own assets.

We cannot build a project of the magnitude needed in most major cities by ourselves even though a plant serving a million people can generate the equivalent of as much as 5,000 barrels of oil per day. The need for disposal of their solid waste still remains and the demand for local lower cost fuels also remains.

Accordingly, for future projects, CEA has sought third-party investors to make the investments in its entirety or share the provision of capital. But investors with the resources necessary to fund these projects are seeking, quite understandably, profitable investments based on the economics of the project and their return on investment relative to the risk. Since the economics of at least the first several years of most resource recovery systems may not be attractive, investment tax credits provide a substantial improvement in the return on investment. A tax credit provides an immediate return which is necessary to attract investment in competition with more reliable investment opportunities in the many more profitable non-energy-related areas.

An investment in new technology which has not yet achieved large scale commercial success poses a myriad of risks to a prospective investor. These are compounded by the magnitude of the investment required, typically $100 to 150 million for a major urban resource recovery plant. The pool of available debt for tax exempt financing is increasingly limited because bond counsels appropriately require "riskless" investments. Private risk capital is, therefore, essential.

Even the large corporations who have resource recovery interests, American Can Co., Combustion Engineering, Signal Companies, Raytheon and those who once had, like Grumman and Occidental, have not viewed it as an attractive investment in competition with other corporate ventures with much surer returns. The risk taking has been left to the entrepreneurs who must attract outside capital with the promise of large returns on investment through tax credits and the economic viability of the project.

The Senate Finance Committee recently concurred with this judgment in the Senate version of the Crude Oil Windfall Profits Tax Act of 1980 and proposed a 20-percent energy tax credit for biomass properties. With the prospect of the enactment of this level of energy tax credit, we had several interested equity investors in Eco-Fuel projects for two of the Nation's hard core inner cities, Newark and the South Bronx. When the prospect of the 20 percent energy tax credit terminated in the conference committee's actions, the investors reevaluated the projects on their internal uncertain economics and therefore they decided not to proceed.

In fact, in comparison to other alternate energy technologies, the Windfall Profits Tax Act actually placed resource recovery at a competitive disadvantage by giving other technologies a 15 percent tax credit, production tax credits or other subsidies. These distort the relative real economic positions of the various alternate energy sources and divert investment away from urban waste to energy facilities.

One New York investment firm, Wertheim & Co., has advised:

> We feel that a 20 percent ITC for waste to energy would be an effective mechanism for reestablishing the desirable relative positions among new source possibilities and on an absolute basis would insure that investors will again look favorably on waste to energy as a desirable investment opportunity.

We do plan to proceed with these plants as quickly as we can. The investment tax credit makes it feasible for us to move with both the Newark project and the South Bronx project immediately.

Senator WALLOP. Thank you.

We will put your charts and the rest of the statement in the record as if delivered. We appreciate it very much.

[The full statement of Mr. Beningson for the record follows:]

STATEMENT OF ROBERT M. BENINGSON

I am Robert M. Beningson, Chairman of the Board, President and Chief Executive Officer of Combustion Equipment Associates, Inc. ("CEA"), a New York Stock Exchange listed company. We have almost ten thousand stockholders who have been attracted over a number of years by the promise of our manufactured products and process technology in pollution control, efficient combusion systems and generation of synthetic fuel from municipal and agricultural wastes. Our efforts to perfect the ECO-FUEL(R)II process and the associated high price to us as a corporation have made us very visible lately to readers of financial journals.

My support today of S. 3006 is unrelated to CEA's immediate circumstances. I come to share with you some of my experiences as one of the developers and operators of a system which is successfully and routinely converting municipal waste into an efficient fuel substitute and sold at a cost less than today's oil prices. ECO-FUEL is replacing more than 50 percent of the oil burned in a standard utility boiler at Bridgeport, Connecticut, generating electricity with as much efficiency and apparently more cleanly than with oil alone.

Since the early 1970's, CEA has spent more than $150 million in the development of this proprietary process with no government support. This is a private investment almost equal to the total assets of CEA at this time. We committed our financial resources to synthetic fuel when the 1974 energy crisis presaged the inevitability of the national energy goals of the 1980's. However, because of the rapidly growing construction and development costs, it is beyond the capability of a firm of our size to do so in the future. We cannot build the projects of the magnitude needed by most major cities by ourselves even though a plant serving a million people can generate the equivalent of as much as 5,000 barrels of oil a day. The demand for disposing of their solid waste remains and the demand for local lower cost fuel remains.

Accordingly, for future projects, CEA has sought third party investors to make the investment in its entirety or share the provision of capital. But investors with the resources necessary to fund these projects are seeking, quite understandably,

profitable investments based on the economics of the project and their return on investment relative to the risk. Since the economics of at least the first several years of most resource recovery systems may not be attractive, investment tax credits provide a substantial improvement in the return on investment. A tax credit provides an immediate return which is necessary to attract investment in competition with more reliable investment opportunities in the many more profitable non-energy related areas.

An investment in new technology which has not yet achieved large scale commercial success poses a myriad of risks to a prospective investor. These are compounded by the magnitude of the investment required, typically $100–150 million for a major urban resource recovery plant. The pool of available debt for tax exempt financing is increasingly limited because bond counsels appropriately require "riskless" investments. Private risk capital is, therefore, essential. Even the large corporations who have resource recovery interests, American Can Co., Combustion Engineering, Signal Companies, Raytheon and those who once had, like Grumman and Occidental, have not viewed it as an attractive investment in competition with other corporate ventures with much surer returns. The risk-taking has been left to the entrepreneurs who must attract outside capital with the promise of large returns on investment through tax credits and the economic viability of the project.

The Senate Finance Committee recently concurred with this judgment in the Senate version of the Crude Oil Windfall Profits Tax Act of 1980 and proposed a 20 percent energy tax credit for biomass properties. With the prospect of the enactment of this level of energy tax credit, we had several interested equity investors in ECO-FUEL projects for two of the nation's hard core inner cities, Newark and the South Bronx. When the prospect of the 20 percent energy tax credit terminated in the Conference Committees' actions, the investors reevaluated the projects on their internal uncertain economics. In fact, in comparison to other alternate energy technologies, the Windfall Profits Tax Act actually placed resource recovery at a competitive disadvantage by giving other technologies a 15 percent tax credit, production tax credits or other subsidies. These distort the relative real economic positions of the various alternate energy sources and divert investment away from urban waste to energy facilities.

One New York investment firm, Wertheim & Co., has advised: "We feel that a 20 percent I.T.C. for waste to energy would be an effective mechanism for reestablishing the desirable relative positions among new source possibilities and on an absolute basis would insure that investors will again look favorably on waste to energy as a desirable investment opportunity."

It should be made clear that the attraction of tax benefits in no way lessens the incentive to produce energy or profits which will be taxable, since failure to operate a plant for at least seven years would result in recapture of some or all of the tax benefits.

Expansion and extension of energy tax credits was the incentive of choice of an Advisory Panel on Synthetic Fuels to the House Committee on Science and Technology. In a report dated February 14, 1980, the panel found that "neither the proposed Synthetic Fuels Corporation or current tax laws will provide the economic incentives necessary to stimulate large scale synfuels production." Its primary recommendation was an expansion and extension of the special energy investment tax credit in order to offset the high risks and huge capital investments which commercialization of synfuels involves.

Tax credits are a proven means of attracting investors of the size and profitability who are the only source of the capital required. Tax credits use traditional money market mechanisms. They are well understood by the financial community. They require no new administrative bureaucracy with a life of its own. They can be of limited duration and can be eliminated when risk has been reduced.

What is the cost to the Federal Treasury of such credits? We should not lose sight of the fact that tax credits create tax paying projects. The traditional Congressional approach of estimating "lost revenues" to the Federal Treasury ignores the reality that the Treasury will actually gain substantial corporate and personal income taxes and social security payments over the long term which would not have been generated without the tax credit.

We have calculated that during a 3 year construction period, $37.5 million will be generated in personal and corporate income taxes and social security payments from direct and indirect labor. In addition, taxes payable (average 5 percent) on corporate profits in a $150 million project would be $7.5 million. Thus, the $45 million "lost" to the Federal Treasury from a 20 percent tax credit on a $150 million project will be totally offset by $45 million in new revenues just during construction.

Furthermore, we can demonstrate the revenue "gain" to the Federal Treasury would be over $165 million (in 1980 dollars) in personal, income and social security taxes over the life of the project.

Nevertheless, recognizing your fiscal responsibility to the Treasury, I also submit Exhibit 1, a projection of tax revenue impact prepared in January 1980 by Paine Weber for the Ad Hoc Committee on Resource Recovery, a coalition of private firms and public agencies concerned with solid waste, who support the 20 percent energy tax credit.

In Exhibit 2, I call to your attention limitations on the use of these credits, which restrict the usefulness of investment tax credits for a medium size company which has invested so heavily in energy development that it does not have taxable profits. Remedying these deficiencies merits your attention.

In conclusion, I will point out that: Waste to energy is one of the two most significant short term contributors to the nation's synfuel goal; tax credits are the most rapid and effective means to offset high risks and huge capital requirements of synfuel projects; waste to energy is at a competitive disadvantage with other synfuels under Windfall Profits Tax Act; investor resistance is overcome at a 20 percent energy tax credit; and during construction of waste to energy plants, a 20 percent energy tax credit will cause no loss in revenue to the Federal Treasury and over the life of the plant can result in a substantial gain.

[Exhibits 1 and 2 follow:]

EXHIBIT 1

COST AND ENERGY SAVINGS OF ') CREDITS AND EXPANDED USE OF INDUSTRIAL DEVELOPMENT BONDS FOR MUNICIPAL SOLID WASTE

Provisions in H.R. 3919 (Senate Amendments)	1980-1990 Revenue Loss Estimates ($ Millions)	Tons of Solid Waste Capacity Installed 1980-1990 (Millions Tons/Year)	Oil Saved By Investments 1980-1990 (Millions of Barrels/ Year)	Tons of Solid Waste Processed (Tons/Day)	Impact on Oil Savings By 1990 (Barrels/ Day)	Total Capital Requirements to Yield Projected Capacity ($ Millions)
				(1)		(2)(3)
20% Energy Tax Credit for Non-Wood Biomass and 10% Tax Credit for Tax Exempt Bonds (1980-1990) (Garbage to Energy)	$255 to $377.5	37,500 to 55,000	39,000 to 57,000	102,000 to 151,000	106,080 to 157,040	$5,100 to $7,550
Expanded Use of Industrial Development Bonds to Cover Turbo-Generation (Electrical) Equipment	$163 to $241	(4)	(4)	(4)	(4)	(5) $1,250 to $1,838

ASSUMPTIONS:

1. Conversion factor is -- one barrel of oil equivalent = 1 ton of garbage X 1.3 X 80% plant capacity factor.
2. 48 to 68 medium (1500 tons/day) and large (3000 tons/day) scale plants are projected to be built with the tax incentives proposed. Of the total projected plants 1/2 are assumed to be privately owned and 1/2 are assumed to be publicly owned.
3. Capital Requirements = $50,000/ton of garbage.
4. The tons of solid waste processed and oil equivalent saved will remain unchanged.
5. 25% of total plant cost is assumed to be the cost of electrical generation equipment.

Prepared by Paine Webber Jackson Curtis, January 1980 for Ad Hoc Committee for Resource Recovery

EXHIBIT 2

Limitations on Use of Investment Tax Credits

1) I.T.C. can only be utilized in a tax year where taxpayer has a tax liability.

2) Limitation based on amount of tax -

a) 1980 - $25,000 plus 70% of excess of tax over $25,000
b) 1981 - " " 80% " " " " " "
c) 1982 - " " 90% " " " " " "

3) Limited carryover and carryback periods - I.T.C. can only be carried back three years and forward seven years.

4) Recapture of I.T.C. -

If there is a disposition of investment credit property and such dispositions occurs prior to the required holding period, a re-calculation of the allowable I.T.C. is made. The original I.T.C. taken in excess of this amount is recaptured.

Because of the extremely large capital investment in resource recovery plants it is quite possible that net operating losses will result for an extended period of time.

Because of the limitations imposed, a taxpayer in a net operating loss position does not currently benefit from Investment Tax Credits. In some cases all or some credits might be lost due to the limited carry-over and carryback provisions.

Also under present law buildings do not qualify as investment credit property (Section 38 Property) and as such no I.T.C. is available on these costs.

As some portion of the resource recovery plant would be considered a building, no tax benefit, in the form of tax credits, would be available on this portion.

Senator WALLOP. Mr. Barker.

STATEMENT OF JAMES L. BARKER, PRESIDENT, CSI RESOURCES SYSTEMS, INC., BOSTON, MASS.

Mr. BARKER. I am Jim Barker, president of CSI Resource Systems, Inc. of Boston. We are consultants solely in the field of waste to energy. We have been involved in one aspect or another in about 30 waste to energy projects, and today are involved in several large projects, including those in New York City, St. Louis, San Francisco, and Bridgeport. Our business is entirely for public entities. Therefore, my comments will be from the viewpoint of the public, not from the private sector.

As you probably know, there are some 130 million tons a year of solid waste to dispose of in the country. We feel that between 50 and 60 percent of this solid waste can be essentially diverted into energy production. That represents 220,000 barrels of oil a day equivalent. To get this much energy we need to process roughly 191,000 tons a day of garbage.

Currently there are some 130,000 tons per day of solid waste processing capacity in some stage of development, from planning to construction and startup. A hundred thousand of that 130,000 tons a day of planned capacity is currently in the predesign stage, that is, feasibility studies, planning, and preliminary design. The immediate challenge is to bring that 100,000 tons of activity in this field to reality; to final design and construction and operation. That will take some $6 billion, in current dollars, of new capital investment. That, we think, is the immediate challenge.

We think the problems today are not so much technological problems. We have a considerable technology base in this country for producing energy from waste. The real problems are of an economic nature. The first year economics in waste to energy projects tend to be noncompetitive with land disposal of solid waste. Typically it costs a community today $8 or $10 to dispose of garbage in a landfill. It costs, in order to balance the economics of resource recovery projects, upwards of $20 to dispose of garbage. Therefore, in order for a community to make a commitment to the sponsorship of a waste energy project, those early year economics have to be brought more in line with the cost of landfill disposal.

Second, because of the enormous investment required to build a plant—a 2,000-ton-a-day plant can cost $100 or $125 million—and because of the risks perceived by the investment community in waste to energy projects, it is very difficult to attract private investors.

My written testimony now illustrates the impact of various and sundry tax policies on the disposal costs that the public would have to pay to get rid of their garbage in a waste to energy project. The analysis shows two things. One, the very critical nature of the tax-exempt financing to this field and, two, the great importance of attracting equity investment in these very, very expensive plants.

The project we illustrated will displace fossil energy that costs today roughly $3.40 a million Btu's. The project could not be afforded by the public without both tax exempt financing and a 25-percent equity contribution from the private sector.

To summarize, I would like to restate that waste to energy can make a very significant contribution to our alternative fuel goals—perhaps as much as half of the near term goals. It has an environmental benefit, and it very much needs economic incentives to the public and to the investment community to make the commitments necessary to initiate more projects.

Thank you.

[The full statement of Mr. Barker for the record follows:]

STATEMENT OF JAMES L. BARKER

Mr. Chairman, Honorable Members of the Subcommittee, Staff, Ladies and Gentlemen, I am James L. Barker, President of CSI Resource Systems, Inc. headquartered at Boston, Massachusetts. It is an honor for me to have the pleasure of testifying before you today.

I have been working in solid waste resource recovery since 1971. Much of this work has been focused on reducing unnecessary barriers to the development of projects for the production of energy from municipal solid waste. My work has included:

- Delivery of consulting services to several public organizations which are implementing waste-to-energy projects.
- Assistance to various Federal agencies in formulating programs for encouraging the implementation of waste-to-energy projects.
- Development of approaches for streamlining the preconstruction waste-to-energy project implementation process.

Our company is solely devoted to provision of consulting and engineering services in the field of resource recovery. Our staff is multi-disciplinary, and includes experienced professionals in five major areas: engineering, resource management, legal/institutional analysis, economic and financial analysis, and the management and marketing sciences. All of our clients are public organizations involved in some aspect of resource recovery. Most of our work is for municipalities and state authorities who are sponsoring the development of waste-to-energy projects.

We have been involved in several different capacities in over thirty projects in the United States. Currently, we have prime management and technical consultant responsibilities for the following waste-to-energy projects:

- Greater Bridgeport Resource Recovery Project (Connecticut Resources Recovery Authority)
- Caguas, Puerto Rico

- Delaware Solid Waste Authority -- Kent and Sussex Counties Project
- City of New York -- Brooklyn Navy Yard Project
- St. Louis -- Bi-State Development Agency Projects
- City and County of San Francisco
- King County/City of Seattle
- South Central Connecticut Resource Recovery Project (Connecticut Resources Recovery Authority).

In addition, we are responsible for the delivery of technical assistance, under U.S. Environmental Protection Agency sponsorship, to several communities in the Southeast. Finally, through Argonne National Laboratory, we are providing the U.S. Department of Energy with services in support of its waste-to-energy programs. These services range from technology assessments to analyses of the impacts of alternative forms of federal assistance on the economics of typical waste-to-energy projects.

My comments today will focus on the needs for continued and extended tax credits for investors in waste-to-energy projects, and for liberalizing the eligibility of projects for tax-exempt financing techniques. Because of our experience as advisors to, and representatives of, public sponsors of projects, I will address the issue primarily from the viewpoint of a public official interested in accelerating the implementation of resource recovery.

I hope my comments are useful to you, and that you will feel free to call upon me and the staff of my company for any information you may need as your deliberations raise additional questions.

BACKGROUND

The recovery of energy from solid waste represents one of the Nation's best near-term opportunities to develop the contribution of alternate fuels to the nation's energy needs. Municipal solid waste is a fuel supply that is replenishable day in, day out. Its ability to contribute to the Nation's alternative fuel capacity in the near term is very significant:

- The amount of solid waste generated in the U.S. is estimated to be at least 130 million tons per year.
- The recoverable Btu content per ton of municipal solid waste is roughly equivalent to 1.15 barrels of oil (BOE).
- Recovery of energy from slightly more than one-half of the available waste stream will yield about 220,000 BOE per day.

The time is right to move aggressively to develop the energy resource potential of solid waste because:

- Several waste-to-energy technologies have been commercially proven. These technologies can match localized waste supplies with a broad array of market needs for energy in the form of steam or electricity or fuel supplement.
- The presence of waste disposal problems and the availability of local markets for energy from waste creates promising conditions for project implementation in most areas of the country.

Waste-to-energy has reached the stage where commercially demonstrated processes include: massburning waterwall incinerators; modular starved air systems; prepared fuel for specially designed dedicated boilers; and production of refuse-derived fuels (RDF) for cofiring with conventional fuels. These processes have been used in a variety of commercial applications, including: the production of process steam for industry; electricity production;

district heating systems; and RDF as a fuel supplement for coal and oil. The scale of installed systems in terms of processing capacity ranges from 50 tons per day (TPD) to 1500 TPD (with systems up to 3,000 TPD in design). This range indicates that the technology can be applied to process the waste streams of communities as small as 20,000 persons to the largest cities in the country.

The gross annual production cost of waste-to-energy technologies per barrel of oil equivalent produced averages from about $20 to $40. These production costs put waste-to-energy systems near to the point of competing with imported oil as a source of energy.

However, the economic feasibility of a waste-to-energy system in a local project setting is influenced by two important competitive constraints:

- The price of energy charged to the buyer must be more advantageous than the buyer's alternative cost for fuel or energy.
- The disposal fees must balance revenues with costs and must be competitive with the alternative cost of landfill disposal.

Because the cost of landfilling in many areas of the country is relatively low, waste-to-energy systems frequently are not politically supportable disposal alternatives. Local decision-makers face serious difficulties in suddenly increasing their current waste disposal costs, even though the life cycle economics of a waste-to-energy project may be very attractive due to escalation in both energy revenues and the cost of competing landfill. Unattractive project economics in early years is a serious impediment to project implementation.

Furthermore, the technical and economic risks associated with waste-to-energy projects, and their substantial capital requirements (a 2,000 TPD facility can cost $100 million or more), make it difficult for project sponsors to attract private investors.

Despite these problems, there is considerable activity across the country on the part of municipalities to replace landfilling with resource recovery, and to replace fossil fuels with energy from waste. Table 1 indicates that of the approximately 191,000 tons per day of solid waste which must be processed to produce 220,000 BOE per day, about 30,000 tons per day of throughput capacity are already under construction, in startup, or operating. In addition, over 100,000 tons per day of throughput capacity are under serious consideration.

Over $6 billion (1980 dollars) of new capital investment is required to bring this additional capacity from planning and design to construction and operation. Much of this investment will not occur unless the two problems mentioned above are resolved: (1) the economics of resource recovery projects must be reasonably competitive with the cost of land disposal of solid waste before public sponsors of projects will commit to project implementation, and before waste collectors will commit their feedstocks to the projects; and (2) the financial return to private investors must be significant and secure enough for them to commit to the financing of these projects.

The federal government can help both the public sponsor of a resource recovery project and the private investor in the facility by providing indirect financial support which reduces project cost to the public and makes private investment in projects more attractive. Use of our tax policies regarding eligibility for tax-exempt financing and availability of tax credits to investors is an effective means for stimulating progress in recovering energy from waste without interfering in the local and private nature of resource recovery project development.

TABLE 1.

STAGES OF EXISTING WASTE-TO-ENERGY PROJECT ACTIVITY

THROUGHPUT CAPACITY (tons per day)

GEOGRAPHIC REGION**		PLANNING	DESIGN	CONSTRUCTION	STARTUP	OPERATING	TOTAL
I.	New England	9,950	200	150	1,800	1,480	13,580
II.	Middle Atlantic	26,825	1,000	5,950	4,000	1,470	39,245
III.	E. North Central	11,850	1,500	1,200	2,000	3,600	20,150
IV.	W. North Central	5,100	0	0	400	200	5,700
V.	South Atlantic*	16,320	2,200	4,500	50	1,650	24,720
VI.	E. South Central	4,475	1,000	60	100	460	6,095
VII.	W. South Central	4,700	0	0	0	941	5,641
VIII.	Mountain	2,600	0	0	0	0	2,600
IX.	Pacific	12,700	2,020	0	500	120	15,340
TOTAL		94,520	7,920	11,860	8,850	9,921	133,071

* Includes Puerto Rico and the Virgin Islands.

** Geographic regions as defined by the U.S. Department of Commerce, Bureau of the Census.

CASE ANALYSIS

The ability to issue tax-exempt revenue bonds has a substantial impact on the economics of resource recovery projects. Lower debt service translates into reduction in the fees that the public must pay for the disposal of their solid wastes.

The availability of tax benefits to private investors also has a substantial impact on project economics. If the combination of tax credits and depreciation allowances provides returns which offset real and perceived risks, private equity will be attracted to a project. This equity reduces the amount of debt financing required, thereby lowering the debt service portion of the public's fee for waste disposal.

The example presented below illustrates these impacts on the public's disposal costs.

TYPICAL SYSTEM

One typical large-scale waste-to-energy system has the following characteristics:

- Waste processing capacity: 2,250 tons per day
- Annual waste processed: 657,000 tons
- Annual energy production: 681,000 BOE
- Fuel displaced: mix of oil, gas, and coal @ $3.36 per MBtu (1980 $)
- Capital cost: $94.6 million (1980 $)
- Annual operating cost: $9.3 million (1980 $)
- Year financed: 1980
- Construction period: 3.5 years
- Operating period: 20 years

This system is being considered as a replacement for landfilling of solid waste, which today costs the public about $10 per ton, and by 1984 will cost about $14 per ton.

Case One: 100-Percent Revenue Bond Financing, Taxable Interest

In this case, it is assumed that taxable revenue bonds are issued at 12-percent interest for a term of 23.5 years. This results in:

- Bond size = $186 million
- Annual net debt service = $21.3 million
- Net disposal cost per ton = $31 (1984)
- Penalty for switching from landfilling to resource recovery = $17 per ton (1984).

Case Two: 100-Percent Revenue Bond Financing, Tax Exempt

This case is the same as the first case except the interest on the bonds is assumed to be 8 percent. This results in:

- Bond size = $163 million
- Annual net debt service = $15.1 million
- Net disposal cost per ton = $22 (1984)
- Penalty for switching from landfilling to resource recovery = $8 per ton (1984).

Case Three: 25-Percent Equity/75-Percent Taxable Revenue Bond Financing

In this case, it is assumed that the existence of tax benefits attracts private equity to the project for financing 25 percent of the capital cost, but that the remaining cost must be financed through 23.5-year taxable revenue bonds at 12-percent interest. This results in:

- Equity contribution = $27.5 million
- Bond size = $139 million
- Annual net debt service = $15.9 million
- Net disposal cost per ton = $23 (1984)
- Penalty for switching from landfilling to resource recovery = $9 per ton (1984).

Case Four: 25-Percent Equity/75-Percent Tax-Exempt Revenue Bond Financing

This case is the same as the previous one, except the interest on the revenue bonds is tax-exempt and is assumed to be 8 percent. This results in:

- Equity contribution = $27.5 million
- Bond size = $122 million
- Annual net debt service = $11.3 million
- Net disposal cost per ton = $16 (1984)
- Penalty for switching from landfilling to resource recovery = $2 per ton (1984).

SUMMARY

The four case analyses illustrate the substantial impacts which tax-exempt debt financing and equity contributions can have on the economics of a resource recovery project. In this project, the public sponsor would likely not proceed with implementation unless he was reasonably certain he could attract private equity for at least 25 percent of the capital cost and finance the remaining amount with tax-exempt debt instruments. Otherwise, he would not compete with the anticipated cost of

landfilling in the early years of facility operation. If he does not proceed, the country will lose almost 700,000 BOE annually to a landfill. Table 2 summarizes this dilemma.

TABLE 2

Impacts of Alternative Financing Structures

Case	Public Disposal Fee ($ per ton)	Penalty vs. Landfilling ($ per ton)
1. 100% Revenue Bonds, Taxable	$31	$17
2. 100% Revenue Bonds, Tax-Exempt	$22	$ 8
3. 25% Equity/75% Taxable Revenue Bonds	$23	$ 9
4. 25% Equity/75% Tax-Exempt Revenue Bonds	$16	$ 2

CONCLUSION

Production of energy from solid waste represents one of the most attractive near-term opportunities to show real progress toward the Nation's goals of producing the equivalent of 500,000 barrels of oil from alternative fuels by 1987 and 2,000,000 barrels by 1992. In fact, it is possible that by accelerating the commercial application of proven waste-to-energy technologies, upwards of one-third of the near-term alternative fuels goal could be achieved from solid waste. By simultaneously encouraging the recycling of energy-intensive materials, this contribution will be substantially enhanced by concurrent conservation of energy that would otherwise be used to extract and refine virgin materials for manufacturing.

In the past, Congress has taken steps to improve the tax environment for those public and private organizations who are willing to take on the risks associated with resource recovery. However, these steps still lag provisions for other, less attractive, forms of alternative energy production and energy conservation. Hopefuly, this discrimination can be corrected.

The needs of the resource recovery field are clear: (1) the public needs lower cost project financing; and (2) the private sector needs more financial incentives for investment. These two needs are highly interconnected, and argue for further liberalization of our tax policies regarding the tax-exempt status of project revenue bonds and the availability of investment tax credits. In this context, the provisions of S.3006 are a step in the right direction.

Senator WALLOP. Thank you, Mr. Barker.

Dr. Charles Johnson, who is the national director, National Solid Waste Management Association, has been asked to make a short statement.

STATEMENT OF CHARLES JOHNSON, NATIONAL DIRECTOR, SOLID WASTE MANAGEMENT ASSOCIATION

Mr. JOHNSON. Senator Wallop, I thank you very much for permitting me to join this panel at essentially the last minute. I did want to come up here and express the support of the association I represent for S. 3006, particularly section 3.

The National Solid Waste Management Association represents private companies active in the field of solid waste management across the country including a number of companies that are actively seeking to build and operate energy recovery plants to process solid wastes and recover the energy contained therein. The state of this technology is very well developed. It is no longer an experiment. It no longer requires massive infusions of research and development money. What it needs is enough of an incentive to get it across the hurdles that each project seems to face during the early years of its life when it is uneconomical as compared with alternative methods of waste disposal.

By way of reference, let me point out that in Europe and in the Far East there are in excess of 200 such facilities operating containing over 300 individual units. The barrel of oil equivalents that are recovered daily exceed 100,000 overseas whereas in this country we have scarcely 10 facilities operating with energy recovery which is a mere fraction of that which is recovered overseas. Even more alarming, even though we have a few plants, perhaps another 10, that are in startup and construction right now, even more alarming is the fact that the rate of commitment to resource recovery, energy based resource recovery, has in fact decreased in the last few years.

The point is in the last 2 years only two or three plants have been committed in this country. We see investors as being very reluctant to put forth their capital to build these facilities even though they could be built today. So, we see the investment tax credit, the energy tax credit, as the ideal type of Federal incentive to spur this program and get it moving.

I thank you.

Senator WALLOP. Could I ask, why is it that even though energy is increasingly expensive and most rational people think it is increasingly insecure, that that kind of investment commitment has declined? Have you done a market survey?

Mr. JOHNSON. I think the economics are the major reason today. The fact that ultimately disposal costs must be compared with the various methods and financed with the available financing techniques, with the available energy investment credits, still the cost of waste disposal by way of energy resource recovery is in excess of that in what would be considered an approvable land disposal facility.

Senator WALLOP. You spoke of the European and Far Eastern investments. Do those countries in which these projects are going

ahead at such an accelerated rate provide the kind of investment incentives we are speaking of here or similar kinds?

Mr. JOHNSON. It differs from country to country. In some countries its investments have been entirely public sector money derived from local tax revenues. In other countries there have been private investments with incentives such as we are talking about here.

Mr. BARKER. If I may add to that, in Europe there has been for a long time a scarcity of land, for land disposal of solid waste, so they were under pressure much earlier than we were to find alternative methods of waste disposal.

Senator WALLOP. So their pressure has been in essence outside the energy pressures which have been additional?

Mr. BARKER. Yes. In this country the local public sector views waste to energy or resource recovery as waste disposal. It is at the Federal level that it is viewed as an energy production technology.

Senator WALLOP. Mr. Barker, the legislation rests heavily on the ability of the industry to measure the energy savings created by a conservation investment. As consultants in the area do you think the industry has the ability to measure the energy savings which will be stimulated by S. 3006 and the justification that would be required to qualify for credit?

Mr. BARKER. In a typical waste energy project the contract with the energy market, is quite specific on measuring how much energy is produced by the project in a year. That energy would by definition displace a fossil fuel energy.

Senator WALLOP. Mr. Govan, one of the major problems facing many countries in the field of converting waste to energy has been by definition that they are new enterprises which means they might not generate enough tax liability to take advantage of the tax credit. Do you think this legislation could be more effective in encouraging waste to energy projects if the tax credit in S. 3006 were made refundable?

Mr. GOVAN. Yes. The problem is that as a relatively small company, we have to raise the money by equity financing and borowing money. We are at the limits of our ability to do these things. In other words, as in our particular case CEA has a number of profitable manufacturing divisions but all the available funds of the company have been invested in resource recovery. If the investment tax credit were made refundable, CEA would have the additional moneys to proceed with the next project, Newark, and also speed up the prospect of beginning to work in the South Bronx.

Senator WALLOP. In your testimony you referred to the fact that it will replace 50 percent of the oil consumed. Can you give us a rough idea of the total oil savings per year from that Eco-Fuel plant?

Mr. GOVAN. We are on what we call unit No. 1 which is one of three boilers at that station. We propose to convert unit No. 2 in the near future. At the small unit No. 1 we are saving the equivalent of about 300 million Btu's per hour. The oil savings on unit No. 1 at Bridgeport by the use of refuse-derived Eco-Fuel is 413,000 barrels of oil-equivalent per year. This is based on 7,000 hours of operation per year. When the Eco-Fuel plant is in full operation

the oil replacement at United Illuminating will be 2,070,000 barrels of oil per year.

Essentially we are taking an 85 megawatt boiler and displacing 50 percent of the oil which has been used in that boiler for 20 years on a daily basis.

Senator WALLOP. There are other savings similar to that which could be repeated in major plants in the East and in the West?

Mr. GOVAN. Yes, sir, because primarily we are displacing oil with a refuse-derived powdered fuel. So our fuel does not need such as pulverizing equipment which is needed to pulverize coal since it is already pulverized. United Illuminating Co. has made a commitment to proceed with this fuel use which does utilize the fuel output of our Bridgeport facility. We have similar commitments for the Newark plant and South Bronx plant to take all the fuel that we can produce.

Senator WALLOP. It sounds like what Mr. Johnson was talking about. It sounds like you have solved two problems at once, one being energy and the other disposal.

Mr. GOVAN. Yes, sir. In Bridgeport we are taking all the refuse from 10 towns in that particular area and disposing of it in an enviromentally clean way as well as producing the fuel energy.

Mr. JOHNSON. I might add a couple other examples that the entire downtown section of the city of Nashville is heated by heat derived from refuse, a substantial amount of heat needed in the cities of Akron and Harrisburg are provided by steam derived from refuse. This can be repeated in virtually any city in the country where the conditions exist and where the economics are right.

Mr. BARKER. Senator, may I also add something to a comment earlier on refundability of the tax credit?

There has been another problem in the field in that some of the major corporate vendors of waste to energy systems have very little tax appetite. As a result, in order for the tax benefits to be passed on at all to a community by way of reducing the amount of debt financing for a project we have had to go to leverage lease financing which is extremely complicated and among other things tests both the monetary resources of the projects, their attorneys and the patience of those trying to put a project together in the first place.

Senator WALLOP. We would not want to do anything to lessen the opportunity for the attorneys in this program.

Mr. BARKER. I would not want to comment on that.

Senator WALLOP. I think we probably turn out enough opportunities for them in the rest of the things we do in the Congress. Gentlemen, thank you very much.

Mr. BARKER. Thank you.

Senator WALLOP. Next is a panel consisting of William U. Chandler, Washington representative, Environmental Policy Center, and Robert J. Rauch, general counsel, Alliance to Save Energy.

Again your statement can be inserted in the record in their entirety as delivered. I do not mean to treat you differently than anybody else, but if you can summarize a little bit we can still have time for questions.

STATEMENT OF WILLIAM U. CHANDLER, WASHINGTON REPRESENTATIVE, ENVIRONMENTAL POLICY CENTER

Mr. CHANDLER. I am Bill Chandler. I will summarize my testimony.

I would like to thank you, Mr. Chairman, for the opportunity to express the support of the Environmental Policy Center for S. 3006. My testimony will touch upon the need for this legislation, on its considerable merits, as well as on some minor changes that might be made to the bill.

This legislation would provide industry with badly needed fiscal incentives to retrofit and replace existing equipment to improve energy use efficiency. Although recent energy price increases have provided industry with considerable incentive to invest in energy conservation, capital constraints are causing corporations to defer these investments. Federal energy price controls, meanwhile, continue to distort the energy price signals that industrial consumers receive. Moreover, Federal tax policy itself encourages energy consumption. Since corporate tax liability is reduced by deductions for energy expenses, the incentive to save is reduced. If enacted, S. 3006 would help ameliorate these difficulties.

The incentive that S. 3006 would provide, a 20-percent investment tax credit for energy conservation related capital investments, is a sound one. The tax credit mechanism is a proven stimulus to corporate investment. The size of the investment appears to be appropriately matched to the magnitude of the need. One criticism, however, is that the definition of qualified energy property may unintentionally exclude cogeneration equipment, one of the most promising industrial energy conservation technologies. Also, the lower limit on the value of energy saved per barrel of oil equivalent—$11 per BOE—may cause industry to bypass the most optimum capital investments in lieu of investments for which they would qualify for the tax credit. I will discuss each of these topics in turn.

First, American industrial equipment has been described as the most inefficient in a technical sense, in the world. International comparisons of industrial energy consumption tend to verify this. Table 1 in my submitted testimony shows, for example, that the United States uses 80 percent more heat energy to make cement than West Germany, 30 percent more energy to make PVC than England, and 50 percent more energy to make steel than Italy.

Energy, of course, is not the only factor of production that industrial managers must consider. Labor, time, materials, and capital must be conserved. It is usually assumed that industry, with its ability to determine the optimum mix of all factors of production, makes rational choices in determining the level of investment in these factors, which include capital for energy conservation.

When most of American industry was built, however, oil cost $2 per barrel, and the equivalent amounts of energy from coal and natural gas cost less. The great disjunctures of energy price of the 1970's have made the energy consuming equipment of our industries obsolete.

Federal energy legislation has largely ignored the industrial energy consuming sector. This is unfortunate since the industrial sector is the largest and fastest growing energy consuming sector

in the U.S. economy. In terms of energy consumed in end uses, industry requires 36 percent of our annual energy budget. If one includes the energy producing industries along with the energy consuming industries, the total is almost 50 percent. The challenge of energy conservation in the industrial sector is that an enormous investment in capital equipment—perhaps hundreds of billions of dollars—must be made.

The issue that this committee must consider is that these savings, which could be so critically important for the Nation, are not being made for lack of capital. S. 3006 would help correct this situation.

Second, the Federal tax system promotes energy consumption. Corporations, as we all know, may deduct business expenses from their taxable income. Since the marginal corporate income tax rate is 46 percent, this means that the effective cost of using more energy relative to substituting energy-efficient capital equipment is cut almost in half. With the price of oil at $5 per million Btu, the effective Federal incentive to consume energy amounts to $2.50 per million Btu.

This contrasts with the maximum that the existing 10-percent investment tax credit in existence might offer for a capital investment for energy conservation—even assuming that all of the credit could be allocated to the energy saved—of 50 cents per million Btu. More commonly, this incentive probably equals less than 15 cents per million Btu. The Federal subsidy for energy production, again, in contrast, is quite high. Gasohol production, for example, is provided a $5 per million Btu subsidy through the waiver of the Federal gasoline tax alone.

Capital investments for energy conservation can save energy for less than 20 percent the current cost of oil. An example of such an investment is provided in my written testimony. In brief this example describes a typical investment for upgrading industrial evaporators. One such investment reduces energy consumption by 10 percent, or $1.85 per barrel of oil saved.

A more expensive retrofit would save one-third of the energy used in evaporators at a cost of 30 cents per million Btu's. The above example vividly illustrates why the lower limit on the value of energy saved per barrel of oil equivalent should not be included in S. 3006.

Third, industrial cogeneration should not be discouraged. The definition of "qualified industrial energy property" in S. 3006 requires that the new equipment not increase an installation's use of oil or natural gas. This definition, perhaps inadvertently, would preclude the application of the most efficient form of cogeneration from receiving the credit. While cogeneration uses only one-half as much energy per unit of electrical output as do conventional powerplants, the net use of energy at the plantsite itself would be increased.

The importance of applying Brayton (gas turbine) or diesel cycle systems to cogeneration opportunities should not be underestimated. These systems will produce four to six times as much electricity per unit of thermal energy demand as will conventional Rankine (steam) systems. The use of gas or oil in cogeneration could increase the potential of cogeneration from 20,000 megawatts to

100,000 megawatts, an amount equal to all the nuclear powerplant capacity currently under construction.

Gas turbine systems such as the pressurized fluidized bed combustor capable of using solid fuels such as coal of biomass should become available sometime in the 1980's. Natural gas, made more abundant by price deregulation, should provide an efficient transition fuel for use in industrial cogeneration, and its use in this capacity should be encouraged. Residual oil, low in quality and relatively inexpensive, is also a good fuel for cogeneration.

Federal policy, again, should not discourage the combustion of residual oil in industrial cogenerators. Application of these fuels for cogeneration will actually "back out" our use of oil, especially more valuable oil, elsewhere.

In conclusion, let me express my enthusiasm for S. 3006, and my optimism that with innovative Federal policies such as this proposed investment tax credit for industrial energy conservation capital investments, that we in the United States can meet the challenge of future energy demand.

[The full statement of Mr. Chandler for the record follows:]

STATEMENT OF

WILLIAM U. CHANDLER

WASHINGTON REPRESENTATIVE

ENVIRONMENTAL POLICY CENTER

ON

S.3006

THE INDUSTRIAL ENERGY EFFICIENCY AND FUEL CONVERSION INCENTIVES ACT OF 1980

BEFORE THE

SUBCOMMITTEE ON

TAXATION AND DEBT MANAGEMENT GENERALLY

SENATE FINANCE COMMITTEE

U.S. CONGRESS

SEPTEMBER 29, 1980

INTRODUCTION

Thank you, Mr. Chairman, for the opportunity to express the support of the Environmental Policy Center for S. 3006, The Industrial Energy Efficiency and Fuel Conversion Incentives Act of 1980. My testimony will touch upon the need for this legislation, on its considerable merits, as well as on some minor improvements that could be made to the bill.

This legislation would provide industry with badly needed fiscal incentives to retrofit and replace existing equipment to improve energy use efficiency. Although recent energy price increases have provided industry with considerable incentive to invest in energy conservation, capital constraints are causing corporations to defer these investments. Federal energy price controls, meanwhile, continue to distort the energy price signals that industrial consumers receive. Moreover, Federal tax policy itself encourages energy consumption. Since corporate tax liability is reduced by deductions for energy expenses, the incentive to save is reduced. If enacted, S.3006 would help ameliorate these difficulties.

The incentive that S. 3006 would provide, a 20 percent investment tax credit for energy conservation related capital investments, is a sound one. The tax credit mechanism is a proven stimulus to corporate investment.[1] The size of the incentive appears to be appropriately matched to the magnitude of the need. One criticism, however, is that the definition of qualified energy property may unintentionally exclude cogeneration equipment, one of the most promising industrial energy conservation technologies. Also, the lower limit on the value of energy saved per barrel of oil equivalent ($11 per BOE),

may cause industry to bypass the most optimum capital investments in lieu of investments for which they would qualify for the tax credit. I will discuss each of these topics in turn.

THE NEED FOR S.3006

American Industry is Not Energy-Efficient

American industrial equipment has been described as the most inefficient, in a technical sense, in the world.[2] International comparisons of industrial energy consumption tend to verify this.[3] Table 1 shows, for example, that the United States uses 80 percent more heat energy to make cement than West Germany, 30 percent more energy to make PVC than England, and 50 percent more energy to make steel than Italy.

Energy, of course, is not the only factor of production that industrial managers must consider. Labor, time, materials, and capital must be conserved. It is usually assumed that industry, with its ability to determine the optimum mix of all factors of production, makes rational choices in determining the level of investment in these factors, which include capital for energy conservation. When most of America's industry was built, however, oil cost $2 per barrel, and the equivalent amounts of energy from coal and natural gas cost less. The great disjunctures of energy price of the 1970's have made the energy consuming equipment of our industries obsolete.

3

TABLE 1

International Comparisons of Industrial Energy Use in Specific Applications

Industrial Application	Relative Energy Use in Percent (100% = Best)				
	Netherlands	West Germany	Italy	England	United States
Cement Manufacture					
-- Heat	NA	100	110	155	180
-- Electricity	NA	110	115	100	145
Plastic (PVC)	101	NA	105	100	125
Steel Production	135	110	100	130	150
Chlorine Production	125	NA	115	100	130

NA=Not Available

NOTES ON TABLE 1

Comparison of energy consumption across national boundaries is a tenous exercise due to differences in climate, resource availability, prices of energy and raw materials, and so on. With this caveat, however, it is instructive to compare industrial energy consumption for specific processes in the United States and in Europe. Table 1 provides such a comparison for the energy intensive industries of cement, plastics, steel and chlorine production.

The United States uses more energy per unit of output than any of the other countries listed above in each of the four industrial categories. The U.S. uses 50 percent more energy than Italy, the most efficient of those countires cited for steel making, in the manufacture of this basic commodity. West Germany, most efficient in the manufacture of cement, uses 45 percent less energy per unit than the United States. Similar comparisons are made for plastics and chlorine production.

SOURCE: Reference 3

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Industry Is The Largest And Fastest Growing Energy-Consuming Sector

Federal energy legislation has largely ignored the industrial energy consuming sector. This is unfortunate since the industrial sector is the largest and fastest growing energy consuming sector in the United States' economy. In terms of energy consumed in end uses, industry requires 36 percent of our annual energy budget.(4) If one includes the energy producing industries along with the energy consuming industries, the total is almost 50 percent.* The challenge of energy conservation in the industrial sector is that an enormous investment in capital equipment--perhaps hundreds of billions of dollars--must be made. The Federal government should make fiscal incentives and financial assistance a high national priority.

Reducing Industrial Energy Demand Growth

Future industrial energy demand will depend on a number of variables, of which increases in energy price is one of the most important. Table 2 relates the percent reduction in energy intensity (BTU per unit of output) that can be expected under two different assumptions about energy price increases. If energy prices double, for example, we may anticipate a 37 percent reduction in the energy intensity of aluminum and cement production, and an even greater reduction if energy price increases are greater. Other industries offer similar potential. Indeed, much of the savings indicated in the "Energy Prices Double" column in Table 2 is already economically feasible, since the savings estimates were made before the precipitous energy price

*In terms of total primary energy consumed in the energy consuming industries, the percentage of United States consumption equals 25 percent.

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TABLE 2

Estimated Net Energy Intensity* Reduction

in Energy Consuming Industries
(by the Year 2010)

Industry	Energy Prices Double (B Scenario) (percent reduction)	Energy Prices Quadruple (A Scenario) (percent reduction)
Agriculture	15	15
Aluminum	37	45
Cement	37	40
Chemicals	22	26
Construction	35	42
Food	24	34
Glass	24	31
Iron and Steel	24	28
Paper	29	36

*Intensity refers to BTU/unit of output

SOURCE: Reference 5

escalation of 1979. The issue that this committee must consider is that these savings, which could be so critically important for the nation, are being deferred due to lack of captital. S.3006 would help correct this situation. Senator Wallop's bill could make it much more likely that the savings indicated in Table 2 are achieved, and, more importantly, that the date by which the savings are attained will be advanced by five to 10 years.

The Federal Tax System Promotes Energy Consumption

Corporations, as we all know, may deduct business expenses from their taxable income. Since the corporate tax rate is 46 percent, this means that the effective cost of using more energy relative to substituting energy-efficient capital equipment is cut almost in half. With the price of oil at $5.00 per million BTU, the effective incentive to consume energy amounts to $2.50 per million BTU. This contrasts with the maximum that the existing 10 percent investment tax credit in existance might offer for a capital investment for energy conservation (even assuming that all of the credit could be allocated to the energy saved) of $.50 per million BTU. More commonly, this incentive probably equals less that $.15 per million BTU. The Federal subsidy for energy production, again, in contrast, is quite high. Gasohol production, for example, is provided a $5.00 per million BTU subsidy through the waiver of the Federal gasoline tax alone.

The Cost of Energy Saved

Capital investments for energy conservation can save energy for less than twenty percent the current cost of oil. An example of such an investment is provided below:

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The cost of operating a typical evaporator has risen almost 300 percent over the last decade, and all but 27 percent of the increase is attributed to increased steam costs. An evaporator using 33,000 pounds of steam per hour required $175,000 (1980 dollars) worth of steam in 1967 (at $.50 per 1000 pounds), compared with $1 million worth of steam (at $4 per 1000 pounds) in 1980. Evaporators use almost .2 quads of energy, nationwide, each year.

Low cost options for upgrading evaporators include heat exchangers for heat recovery, improved maintenance, and thermal insulation. These investments will save 10, 5, and 5 percent of total evaporator energy use, respectively. Thermal recompression (injecting steam in the evaporated fraction to facilitate the recovery of heat in the vapor) and mechanical recompression require medium to high capital investments, but energy savings of from 45 to 90 percent are possible. Adding extra effects is also a high-cost, high-return option. Adding a fourth effect to a three-effect evaporator will save approximately 25 percent.

Adding a heat exchanger costing $40,000 (1980 dollars) to an evaporator built in 1967 (costing $460,000) and designed to use 33,000 pounds of steam per hour, will save almost 21 billion BTU per year per evaporator at a cost of about $.32 per million BTU. Adding both a heat exchanger and an additional effect with a total cost of $395,000 will reduce the hourly demand for steam to 21,200 pounds. The cost of energy saved would be $.72 per million BTU. The discounted rate of return on the two investments are 200 and 80 percent, respectively. Systems using 40,000 pounds of steam per hour (40 million BTU per hour) and using steam at a cost of $3.40 per 1000 pounds, can justify a $2 million capital investment and expect a 30 percent rate of return.[6]

The above example vividly illustrates why the lower limit on the value of energy saved per barrel of oil equivalent should not be included in S.3006. Any

investment which saved energy for less than $1.90 per million BTU ($11 per BOE) would be disqualified, and this would, therefore, exclude from qualification most of the evaporator improvements used as examples above. Indeed, for evaporators using natural gas, the incentive to conserve would be less than half that of the tax incentive to burn more oil, instead.

Industrial Cogeneration Should Not Be Discouraged

The definition of "qualified industrial energy property" in S.3006 requires that the new equipment not increase an installations use of oil or natural gas. This definition, perhaps inadvertantly, would preclude the application of the the most efficient form of cogeneration from receiving the credit. While cogeneration uses only half as much energy per unit of electrical output as do conventional power plants, the net use of energy at the plant site itself would be increased.

The importance of applying Brayton (gas turbine) or diesel cycle systems to cogeneration opportunities should not be underestimated. These systems will produce four to six times as much electricity per unit of thermal energy demand as will conventional Rankine (steam) systems. The use of gas of oil in cogeneration could increase the potential of congeneration from only 20,000 megawatts to 100,000 megawatts, an amount equal to all the nuclear power plant capacity currently under construction. Gas turbine systems such as the Pressurized Fluidized Bed Combustor capable of using solid fuels such as coal or biomass should become available sometime in the 1980's. Natural gas, made more abundant by price deregulation, should provide an

efficient transition fuel for use in industrial cogeneration, and its use in this capacity should be encouraged. Residual oil, low in quality and relatively inexpensive, is also a good fuel for cogeneration. Federal policy, again, should not discourage the combustion of residual oil in industrial cogenerators. Application of these fuels for cogeneration will actually "back out" our use of oil, especially more valuable oil, elsewhere.

SUMMARY

In conclusion, let me express my enthusiasm for S.3006, and my optimism that with innovative federal policies such as this proposed investment tax credit for industrial energy conservation capital investments, that we in the United States can meet the challenge of future energy demand.

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Senator WALLOP. Thank you very much, Mr. Chandler. I appreciate the concerns with regard to cogeneration. It is my opinion that the bill will be modified rather simply to make clear that that was not specifically excluded though we do have to, I think, retain the overall objective of backing out oil and gas increased use. I do not think that will be complicated to achieve.

Unfortunately I have another vote. I think I will recess, with apologies, for another 10 minutes while I go vote. I will come back and hear your testimony. I will try to complete this hearing with the indulgence of all of you. I still would prefer to go through without a lunch break.

Mr. CHANDLER. With your permission I would like to make some minor corrections to my submitted testimony.

Senator WALLOP. That will be permitted. While we are over here talking about the three filibusters backed up by airplanes, we now have final passage on the continuing resolution.

We will stand in recess for 10 minutes.

[A brief recess was taken.]

Senator WALLOP. I have to be out of here in 20 minutes, with all appologies to the patient people who are left, but it is beginning to crowd on us a little bit. I have another committee meeting starting at 2 o'clock. Please proceed.

STATEMENT OF ROBERT J. RAUCH, GENERAL COUNSEL, ALLIANCE TO SAVE ENERGY, ACCOMPANIED BY LINDA P. GALLAGHER, EXECUTIVE DIRECTOR

Mr. RAUCH. My name is Robert Rauch. I am the general counsel for the Alliance to Save Energy, a national nonprofit organization dedicated to promoting energy efficiency and conservation. With your permission, Mr. Chairman, we will simply summarize our testimony this morning and insert the full statement in the record.

Senator WALLOP. The statement will be inserted in the record in its entirety. I appreciate the summary.

Mr. RAUCH. With me is Ms. Linda P. Gallagher, the executive director of the Alliance. With your permission I would like at this point to ask Linda to give you a few words of background on the Alliance and a description of some of the work that we are doing in this area that might be of interest to your committee.

Ms. GALLAGHER. We appreciate very much the opportunity to testify. The Alliance to Save Energy is a coalition founded by national leaders along with Hubert Humphrey in 1976 strictly dedicated to bringing about greater energy efficiency, to reduce our dependence on foreign oil.

The major work of the Alliance today is really in public education. We have an advertising council campaign and we held a major conference at Dumbarton Oaks last fall along with the author of Energy Future at Harvard University. At that conference the coalition which we represent, which includes business, organized labor, environmental groups and consumer groups, found that there was the opportunity to save at least 30 percent in the industrial sector alone. We also found that to date most of the simple housekeeping items have been done and what we needed to do next was to create the capital incentives for investing in a much larger way in energy conservation.

I might, just before I turn to Mr. Rauch, say that the Alliance will be conducting over the next year a major study on the potential of industrial energy conservation, addressing many of the same questions that were raised in the testimony today. We look forward very much to working with this committee and sharing the results of our study with you.

Senator WALLOP. Thank you very much, Ms. Gallagher.

Mr. RAUCH. Mr. Chairman, at this point, to keep the statement as brief as possible, I would like to summarize just a few key points that have been raised in some of the questions today and mention a couple of areas where I think the bill might possibly be improved. First of all I think it is very important to emphasize that the purpose of the bill is to accelerate energy conservation investment that is not now getting made by providing deadlines. It should provide a major stimulus for corporations to move up some of these investments that are now lagging. I think that is an important argument for the bill that should be considered.

Second, and I think this really goes to the heart of some of the concerns of the Treasury Department, I feel there is a concern that the tax incentive represents a net revenue loss to the Treasury, that in fact it is all outgo. This is part of the reason you see the concern we have heard this morning.

However, this particular approach you propose we think represents a terrific potential investment opportunity for the Treasury and in a relatively short period of time this bill should produce net revenue gains for the Treasury, not revenue losses.

I should like to go through the logic behind that statement. As Mr. Chandler has pointed out, of course energy expenditures are deductible and the corporate tax rate is now 46 percent. This means that if we assume that a barrel of oil now costs $32 at the margin, the OPEC price, about $14.72 of that barrel is effectively paid for, if you will, by the Treasury through reduced tax revenues.

Correspondingly this means that if energy use can be reduced by one barrel, other things being equal, taxable income should go up and tax revenue should increase by $14.72 per barrel of oil that is used less.

Senator WALLOP. I wish Mr. Sunley were here.

Mr. RAUCH. I wish he were too because I think he is missing a good investment. If we apply this logic to your bill, and let us take the maximum credit, the $55 ceiling you are talking about, what we have is a situation where this additional revenue that the Treasury realizes of $14.72 for every barrel less means that the payback period for the Treasury even at $55 is approximately 3.6 years. The first year the Government gets $14.72 more and $14.72 the next year, $14.72 the third year, and by two-thirds of the way through the fourth year the Treasury is in a positive net revenue position, other things being equal.

In other words, the Treasury is a partner with the corporation that is making the investment. This is something I think needs to be emphasized for the Department because it is this concern about revenue loss that I think motivates many of their concerns.

On this same point you talked a good deal this morning about the $11 minimum and there has been concern expressed about this. The Alliance in general favors reconsidering whether this is appro-

priate to include and for the following reasons. It is true that we may end up subsidizing some investments that would have been made anyway. But, Mr. Chairman, at $11 a barrel, and that is the capital subsidy, that investment by the Treasury will pay back in less than a year, again using the $14.72 figure for increased tax revenue.

Even if some investments are subsidized that would have been made anyway, the cost is low, the payback is very fast, and many of these investments of course have a useful life of 10 or 15 years. We are talking about a huge net revenue gain to the Treasury as well as the corporation that is making the investment.

These are some of the points we urge you to consider as you work further on the legislation. Thank you, Mr. Chairman.

Senator WALLOP. Thank you very much. I find that testimony interesting. I had contemplated it to some extent but not the specifics which you were addressing.

There are many people in the country who feel that the cost of an imported barrel of oil is somewhere closer to $75 or $80 rather than the $32 or $45. I happen to be one of those.

So that even if those savings you speak of were not realized, other savings by being able to back out a couple of million barrels a day would far exceed "cost."

Mr. RAUCH. The payback under those circumstances is incredibly short.

Senator WALLOP. You may have been in some of these hearings in which we finally reacted rather violently to the concept of tax expenditure with some implying that all goods and services first belong to the country and then to the people. If there is such a concept of tax expenditure, in at least this instance, we are seeking to purchase something tangible for the expenditure made that is slightly different from some of the other proposed programs which have been put forward with all the best intentions.

I really do not have questions at this moment to direct to you. I appreciate your support and look forward to the report of the organization as we go along. We will try to accommodate that. I promise you we will take a look at the concept of the $11 floor.

We still want to find some means of getting those concepts in line and yet not have it perceived that we are subsidizing something that should happen on its own.

Thank you both very much.

Mr. RAUCH. Thank you, Mr. Chairman.

[The full statements of Mr. Rauch and Ms. Gallagher for the record follow:]

Alliance to Save Energy

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STATEMENT OF

ROBERT J. RAUCH AND LINDA P. GALLAGHER,

ALLIANCE TO SAVE ENERGY

BEFORE THE

SUBCOMMITTEE ON TAXATION AND

DEBT MANAGEMENT GENERALLY

OF THE

SENATE FINANCE COMMITTEE

September 29, 1980

Good Morning. My name is Robert J. Rauch. I am the General Counsel for the Alliance to Save Energy, a national non-profit organization dedicated to promoting energy efficiency and conservation. With me is Ms. Linda Gallagher, the Executive Director of the Alliance. We appreciate very much the Committee's invitation to testify on S. 3006, the Industrial Energy Efficiency and Fuel Conversion Tax Incentive Act of 1980. The recent developments in the Middle East make this hearing particularly timely, and we commend the Committee for taking up the bill at this time.

By way of background, the Alliance to Save Energy (ASE) is a coalition of national leaders representing the business, labor, environmental and consumer communities. The organization is headed by Senators Cranston and Percy. The Alliance is three years old and is involved in education, research, demonstration projects, and a variety of advocacy activities.

Mr. Chairman, at this very moment war is raging in the Middle East. According to available press accounts, Iraqi and Iranian war planes have severely disabled oil production facilities in both countries. The flow of oil from Iran and Iraq has stopped. Three million barrels per day of oil are no longer flowing to the Western nations. The so-called oil "glut" will have disappeared within a matter of weeks. In less than a week's time the gap between supply and demand for OPEC oil has closed.

Once again, the United States and its Western allies are in immediate peril. Should the war spread, the flow of all oil from the Middle East could be cut off. At the very least, it is virtually certain that oil prices will shoot up again.

For the moment, the United States can do little more than urge the parties to lay down their arms. Looking toward the future, however, we must resolve to reduce the level of imports just as rapidly as we possibly can. Fortunately, the opportunities for additional conservation of energy are large. The Alliance has estimated that we could save an additional amount of oil equal to the quantity we now import.

To reach this goal, conservation efforts will have to be accelerated in all three sectors. Although the industrial sector has already achieved significant savings, the potential for additional improvement is still very large. The Committee on Nuclear and Alternative Energy Systems of the National Research Council has reported that even at current energy prices, the steel industry could be consuming 17 percent less energy than it presently uses per unit of output. The paper industry could be using 24 percent less; aluminum, 21 percent; cement, 25 percent; and so on.[1/]

Even these figures, however, may understate the potential savings. Thomas Widener of the Thermo Electron Corporation,

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1. "Energy in Transition, 1985-2010," Final Report of the Committee on Nuclear and Alternative Energy Systems, National Research Council (National Academy of Sciences, Washington, D.C. 1979) at 100.

an engineering consulting firm, has estimated that industry could reduce energy use by 30 percent using existing technology. An analysis of energy use in certain European countries tends to confirm these figures. For example, in West Germany energy intensive industries generally use about 35 percent less energy per dollar of sales than their American counterparts.[1/] Although it is difficult to develop precise estimates, we feel that savings of 4.5 million barrels of oil equivalent per day are possible in the industrial sector.

While the opportunities appear very promising, it is highly unlikely that the full potential will be realized without significant changes in federal energy policy. Despite some headway in recent years, federal policy has largely encouraged the movement of capital into supply, rather than conservation investments. A 1978 report prepared for the Department of Energy by the Battelle Pacific Northwest Laboratories, entitled, "An Analysis of Federal Incentives Used to Stimulate Energy Production," estimated that the federal government has spent between 123 and 134 billion dollars to stimulate domestic energy production since 1918. About 60 percent of this total, $77.2 billion, has gone to the oil industry, mostly in the form of tax write offs for

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1. S. Fenn, "Energy Conservation by Industry," Investor Responsibility Research Center, Inc., January 1979, at 29.

intangible drilling expenses and depletion allowances. Although these tax benefits have been scaled back in recent years, oil and gas tax incentives are still capable of returning almost 50 percent of invested capital in the form of reduced taxes.

The Alliance believes that such incentives have played an important and useful role in contributing to the nation's energy security. Nevertheless, the fact remains that conservation investments capable of yielding significant supplies of "saved" gas and oil have not received anything close to comparable treatment. If a barrel of oil saved is just as useful to the nation as a barrel of oil produced, we should be willing to provide incentives for conservation investments which are similar to those we provide for investments designed to increase production. This is especially true where the cost of oil and gas recovered from buildings and industrial processes is substantially below the marginal cost of new oil and gas supplies. In short, we must begin to view conservation investments as an important new source of energy "supply." Investments in conservation should be analyzed on essentially the same basis as investments in production.

S. 3006 incorporates many of these principles, and we believe it is a step in the right direction. Senator Wallop and the bill's other sponsors have correctly focused on the relative capital costs to obtain a barrel of oil equivalent from both production and conservation investments. This approach allows a direct comparison between the amount of

capital needed to generate an additional barrel of oil equivalent from either a new well or an existing industrial process. Although it is difficult to generalize, it seems quite clear that many conservation investments in industry can "produce" barrels of oil equivalent at a capital cost which is substantially below that of producing barrels of oil equivalent from conventional and new sources of energy.

Although energy conservation investments in industry appear very cost effective, they do require capital. The sponsors of the bill correctly have recognized that the availability of capital is the single most important barrier to accelerated energy conservation investments in industry. Last fall the Alliance to Save Energy in conjunction with Harvard University sponsored a conference at Dumbarton Oaks designed to identify the principal barriers to accelerated conservation efforts in all three sectors. Significantly, the group which reported on conservation potential in industry concluded that "allocation of capital is, perhaps, the greatest barrier to raising the productivity of industrial use."[1/] The report also points out that "government incentive programs to date have been much too small to have an appreciable impact on the capital allocation problem for the very large investments required. These incentives are especially needed for high risk, high pay off energy

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1. Dumbarton Oaks Symposium, "The Dynamics of Energy Efficiency," Alliance to Save Energy, October 1979, at 23.

conservation and energy conservation related investments; however, even many low risk projects are not going forward because of lack of capital funds."[1/]

Despite their great value to the nation, energy conservation investments in industry must compete with a variety of other needs for capital. Mandatory capital expenditures -- those required to stay competitive, to expand into new markets, or to meet federal safety or environmental standards -- have first priority.[2/] Furthermore, there is some evidence that certain companies appear to require a higher rate of return on energy conservation investments than is required on investments designed to maintain or expand market share.[3/] In one recent report Thermo Electron described a cement company that could have obtained an after-tax profit of 22 percent from an investment designed to recover waste heat. The company's investment criteria, however, required that discretionary investments that would not result in increased production have a return of at least 30 percent. Thus, although the rate of return from an investment in a conservation measure would be higher than that required for production investments -- often only about 15 percent -- the company rejected the waste heat recovery unit. Additional tax incentives designed to put the conservation investment on a more equal footing

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1. Id.
2. S. Fenn, op cit. at 37.
3. Id.

with production investments might very well have changed the result.

In short, S. 3006 should free up significant additional amounts of capital for energy conservation investments in industry by increasing the rate of return on such investments. By imposing a $55 ceiling on recoverable capital costs per annual barrel of oil equivalent saved, the measure makes certain that the nation encourages only investments which are cost-effective when viewed against other production investments. At this level, any conservation investment which is supported by additional tax credits will "produce" barrels of oil equivalent at a cost substantially below that incurred to develop oil from shale or high BTU gas from coal. According to estimates prepared by the American Gas Association, these technologies require over $200 in capital investment for each annual barrel of oil equivalent produced. As we will show below, the Committee may even find it useful to give consideration to raising the $55 figure for certain investments which have a relatively long expected life.

Despite all of these benefits, the question remains in the minds of many, is this proposal a good "investment" for the nation and the U.S. Treasury? There is no question that the additional tax incentives provided by this measure will result, at least initially, in increased tax revenue losses to the Treasury. At a time when the budget is under severe pressure and inflation is a constant threat, we must be sensitive to the fiscal impact of any new tax incentives which are proposed.

Fortunately, in contrast to some types of tax incentives, we feel that this proposal offers excellent "investment opportunities" for the Treasury. According to a very preliminary economic analysis performed by Alliance staff, this measure has the potential to actually increase Treasury tax revenues within a relatively brief time. This is due to the fact that tax credits are tied to actual energy savings.

As the Committee knows, energy expenditures are deductible expenses for businesses under Section 162 of the Internal Revenue Code. They are "ordinary and necessary" business expenses. For a corporation which is in the 46 percent marginal tax bracket, this means that the true cost of every dollar spent on energy is actually 54 cents, after taxes. Other things being equal, this means that taxable income will rise by $1.00 for each dollar less that is spent on energy to produce goods and services. In other words, reduced energy expenditures have the potential to increase tax revenue if they can be achieved at a "cost to the Treasury" of less than 46 cents on the dollar.

A simple example should help illustrate how these principles apply to the Wallop proposal. Under S. 3006, the credit for "other conservation property" is limited to the lesser of 20 percent of qualified investment or $55 for each barrel of oil equivalent saved in one year by the investment based on pre-project levels of production. In return for this maximum $55 per barrel of oil equivalent capital contribution, the Treasury is given the opportunity

to share in the savings produced by the capital investment. As indicated above, other things being equal, taxable income should rise by $1.00 for every dollar of energy use saved by the investment. This means that for every dollar of energy use saved by the investment, the Treasury effectively "recovers" 46 cents in increased tax revenue, revenue which would not have been collected but for the energy saving capital expenditure.

To estimate the maximum payback period for the Treasury, let us assume that the cost of a barrel of oil equivalent to a company is $32, the current OPEC price. At a 46 percent marginal tax rate, this means that each barrel of oil consumed "costs" the Treasury $14.72 in reduced tax revenues (46¢ x $32.00). Conversely, if the cost of producing a product can be reduced by the equivalent of one barrel of oil, taxable income should increase, other things being equal, by $32 and Treasury revenues by $14.72.

To calculate the payback period for the Treasury, we divide the potential increase in tax revenue from use of one less barrel of oil per year into the subsidized capital cost of $55 per barrel of oil equivalent per year. According to our calculations, the payback period for the Treasury is approximately 3.6 years if the maximum credit is utilized, that is $55 per barrel of oil equivalent saved per year ($55 ÷ $14.72). After the fourth year of the investment, the additional savings realized produce a net revenue increase for the Treasury.

As should be obvious, these calculations contain an important assumption, one which perhaps should be incorporated explicitly into the bill. The assumption is that the useful life of the conservation investment is at least equal to the Treasury's "effective payback period." In the example above, it is assumed that the investment will have a life of at least four years.

Several caveats are in order. First, the payback period depends heavily on the price assumptions which are used for each barrel of oil equivalent saved by energy conservation investments. To the extent that natural gas costs less per barrel of oil equivalent than imported oil, the effective payback period is increased. Also, the above analysis presents the payback period for only the additional tax incentives provided by this bill. Other existing tax incentives, such as the 10 percent investment tax credit and depreciation allowances, will result in an additional tax revenue drain on the Treasury from each investment, and thus increase the payback period for the Treasury.

On the other hand, the available evidence suggests that most conservation investments made by industry have an expected useful life of substantially greater than five years. Furthermore, many investments will produce barrel of oil equivalent savings at a cost substantially below the maximum of $55 per barrel of oil equivalent saved in the first year. For example, if an energy conservation investment will cost one million dollars and is expected to save 10,000 barrels

of oil equivalent per year, the effective credit is $20 per barrel of oil equivalent ($200,000 ÷ 10,000 BOE). If the additional tax revenue per barrel of oil equivalent saved is still equal to $14.72, as calculated above, this means that the investment will "pay back" for the Treasury in less than two years. This analysis suggests that the $11.00 per barrel of oil equivalent limitation now contained in the current bill is not necessarily in the Treasury's or the nation's interests. Refusing the credit to those capital investments which produce savings at extremely low cost will not benefit the Treasury. If we assume that a number of these very attractive investments will not be made in the absence of additional tax credits, both the Treasury and the affected companies stand to lose. Clearly, if the Treasury can increase tax revenues in the first year by an additional $14.72 for each barrel of oil equivalent which is not used by a company, it is well worth spending $11.00 per barrel of oil equivalent to finance an investment which will pay back in less than one year.

Obviously, an argument can be made that these investments would be made in any case and that the Treasury would realize the increased revenues without extending any credits whatsoever given the extremely high rate of return on such investments to industry. Nevertheless, the fact remains that a number of these very lucrative investments are not being made because of a severe competition for capital within companies. Even if some of these investments

would have been made without tax incentives, the relative cost to the Treasury is low and the potential revenue gains are very high.

In the next few months, the Alliance hopes to conduct an intensive study of industry investment behavior and hopefully will be able to provide additional information on whether industry is likely to invest in these relatively "high pay off" investments without additional tax incentives. In the meantime, we suggest that the Committee explore the same issue and consider dropping the $11 per barrel of oil equivalent minimum for qualification for the 20 percent tax credit.

At the other end of the scale, we suggest that the Committee give consideration to increasing the $55 per barrel of oil equivalent maximum credit if the taxpayer can establish that the useful life of the investment is substantially greater than the effective payback period for the Treasury. If a conservation investment is expected to produce savings for 10 years or more, for example, it seems short-sighted to deny the expanded tax credit to finance an initial capital investment which exceeds the current criteria in the bill, but which will return substantial energy savings both to the company making the investment as well as the Treasury in the form of increased tax revenues. We suggest that this approach may make more sense than simply setting a flat ceiling of $55 per barrel of oil equivalent saved. This is especially true in view of the fact that energy prices are likely to go up in the future and the value of

conservation investments will correspondingly increase.

The foregoing are our preliminary thoughts. As indicated above, we expect to do substantially more detailed analysis of S. 3006 as well as other proposals to encourage energy conservation in the months ahead. While we feel that the Wallop proposal can be improved upon, we believe it is an important step forward and deserves the Committee's careful and full consideration.

Thank you for your attention, and we would be happy to answer any questions you may have at this time.

Senator WALLOP. There is one other panel, Mr. Larry Steenberg and Mr. Max Funk. Mr. Funk is vice president of Zurn Industries, representing the Environmental Industry Council, and Mr. Larry Steenberg is chairman of the American Petroleum Refiners Association.

It is my understanding they are willing to tolerate the circumstances that have surrounded us and simply submit their testimony and await any questions that may come from the committee. I do not, however, want to deny them the opportunity, wherever they are sitting in this room, and having exhibited all their patience, to testify if they prefer to testify.

I do appreciate your courtesy. I do understand what I have done is make you wait until half past one and then having you forego the chance to testify. I am more than willing to stay if you prefer to make an oral statement now.

Mr. FUNK. If you will accept the statement for the record.

Senator WALLOP. I will accept and appreciate it very much. Thank you all.

[The formal statements of Mr. Funk and Mr. Steenberg for the record follow:]

TESTIMONY OF MAX FUNK, ZURN INDUSTRIES, ON BEHALF OF THE ENVIRONMENTAL INDUSTRY COUNCIL

My name is Max Funk. I am executive vice president of Zurn Industries, a manufacturer of energy conversion and environmental control systems. I am here this morning testifying on behalf of my company and the Environmental Industry Council. The Council is a Trade Association for the Manufacturers of air and water pollution control equipment. Members of the Council produce 80 percent of the equipment used for these purposes.

The Council is in total support of investment tax credits for energy conservation and fuel conversion equipment and processes.

Our total economy is a very inefficient user of energy. According to a recent study by Georgetown University, we had a total energy input of 80 quads in 1979. (A quad is roughly equal to 170,000,000 barrels of oil, or to the annual output of Twenty Three Mile Island-sized power plants.) Of the 80 quads input, only 40 quads were available for useful work, or at an efficiency rate of 50 percent.

By comparison, the industrial segment of our economy used its energy at an 84 percent efficiency rate, and industry is making extensive efforts to improve this. From 1973 to 1979, industry reduced its energy use by 10 percent while increasing its output by 12 percent, resulting in a saving of 1 quad of energy. These savings

were primarily through programs of improved maintenance and easily applied energy conservation equipment and materials, such as waste heat boilers, insulation, and automatic controls.

Now we are at a point where additional energy conservation and fuel conversion will require large capital investments in a climate where capital is limited, and energy investments must compete with productivity investments.

A major segment of energy use in industry, roughly 6 quads in 1979, is for boilers to produce steam for process and space heating. Such boilers create a substantial market for the members of our Council who produce air pollution control equipment.

Assuming that an industry needs an additional 150,000 pounds of steam per hour to expand a production facility, capital cost for an oil or natural gas fired boiler would be about $2.2 million, and annualized operating costs would be about $2.5 million. A comparable coal fired boiler would require about $7.8 million capital costs, not including air pollution control equipment which would add 20 to 30 percent, and annualized operating costs of $3.2 million. These are data from a recent EPA study. Obviously, the additional investment for coal firing could never pay for itself. Under the Fuel Use Act of 1978 this should certainly qualify for an economic exemption, but this does nothing to encourage the use of fuels other than gas or oil.

We recognize that these estimates are contrary to those made for conversion of existing equipment as discussed in the oil back out legislation. Those analyses are for existing units that are already capable of burning coal.

With a substantial investment tax credit, the net capital investment and corresponding annualized operating costs in our example might make the coal fired unit an investment that could be justified. Similarly, capital investment in energy conservation equipment such as economizers and air heaters could be more readily justified with a substantial investment tax credit.

The Environmental Industry Council urges you to keep the application of investment tax credit as simple as possible. We ask that you consider the elimination of the variable credits based on barrels of oil equivalent costs in their entirety. These requirements would add unnecessary complexity to the regulations for implementing the legislation.

We urge you to give this legislation your careful consideration. Looking to our Nation's energy future it is important for Congress to provide the type of tax incentives called for in S. 3006.

American Petroleum Refiners Association

SUMMARY OF TESTIMONY

S. 3006 is a comprehensive and thoughtful approach to conserving energy through the use of tax credits. Given the present economic and regulatory climate, the small refining industry in particular needs this type of temporary assistance, in the form of measured tax incentives, to upgrade its facilities and become more energy efficient.

APRA suggests that the Finance Committee consider modifying the bill to add a number of items of refining energy property to the existing list of specially defined energy properties. Credits for these few additional items of equipment will result in the saving of approximately 25,000 barrels per day of oil or its equivalent in the small refining industry alone.

APRA also suggests that the Committee consider lowering the present $11 BOE cost limitation below which no tax credit is allowed.

Finally, APRA asks that the effective date for investment in property qualifying for the credit be changed from July 31, 1980 to December 31, 1979.

Testimony of American Petroleum Refiners Association

Mr. Chairman, my name is Larry Steenberg. I am Chairman of the American Petroleum Refiners Association as well as President of Laketon Asphalt Refining Incorporated of Evansville, Indiana. The Association I chair represents 64 small and independent domestic refiners and has 21 associate members. It is the largest trade association representing small refiners. A list of our members appears at the end of my written statement.

Mr. Chairman, as you are probably aware, the domestic, small refining industry is going through a very difficult period. At the same time that the entitlements program is being withdrawn, oil prices are going through the ceiling; the supply of domestic sweet crude oil is dwindling; the composition of crude available for refin-

ing is changing from sweet, light crude to heavier, more sour crude; there is and will continue to be a decline in the demand for one of the principal products manufactured by small refiners—residual oil; society and government are demand more and more sophisticated products, such as, unleaded gasoline; and the cost of money for financing conversion and retrofitting has likewise gone through the ceiling.

It will come as no surprise, therefore, that the small refining industry is seeking by means of a number of avenues, including tax proposals, a measure of relief to help them through the next 6 or 7 years during which the industry will be converting and upgrading facilities. Small and independent refiners must and will as necessary upgrade their facilities to process a wider range of more readily available crude types into a broader range of more sophisticated products. At the same time we must continue to be as energy efficient as possible.

We recently testified before this Subcommittee and before the House Ways & Means Committee on a number of tax proposals. One of those proposals encompassed 5 specific additions to the list of specially defined energy property presently eligible for an additional 10 percent energy tax credit. This energy tax credit was enacted in 1978 and slightly modified in 1980. The 5 specific items to be added to the statute include such things as process heater firing controls, retrofit trays, improved catalysts, and gasoline blending optimization equipment. (A more complete description of our proposal appears as an attachment to my written statement.)

Our best estimate is that a proposal along these lines could increase energy savings by as much as 10 percent in the small independent refining segment of the industry alone. Put differently, the small and independent refiners might be moved to save 25,000 barrels per day. Since the proposal is not limited to small and independent refiners but would benefit all domestic refiners, the actual savings might be 3 or 4 times as great.

S. 3006 addresses the same subject as our proposal—that is, encouraging energy conservation by means of tax credits. It does so not by eliminating the existing alternative energy property and specially defined energy property tax provisions, but by adding a more comprehensive set of provisions intended to cover certain highly energy efficient properties. The bill would provide an additional 20 percent investment tax credit, which would be available to all industrial energy users for all types of energy property. Expenditures would qualify for the industrial energy property credit generally where the investment achieves energy savings within a certain range—not so great that the user should make the expenditures absent any incentive and not so little that the expenditure is not really cost efficient.

We enthusiastically support the bill as a thoughtful and well-conceived piece of legislation. A great deal of consideration has been given not only to the underlying policies but also the mechanics of this proposal.

We would point out, as has its sponsor, that 40 percent of this country's energy use is attributable to industry in general, and 70 percent of this figure is attributable to just 6 industries, of which petroleum refining is one.

We would request that the items of equipment listed in our proposal be added to the existing list of specially defined energy property and that all remaining items of refining equipment be left to qualify under new section 44F as set forth in S. 3006.

We are concerned that the lower limit for the BOE cost ratio contained in the bill might not be as low as it should be in order to entice at least small and independent refiners to invest in energy conservation equipment. In this segment of the refining industry, given the high cost of money and the competing demands for the small refiner's capital investment, refiners are reluctant to invest in any type of property that does not have a payback period of 3 years or less. With the current price of uncontrolled crude oil at over $30 per barrel, and in the recent past, as high as $36 to $38 per barrel, the remaining payback period for an investment qualifying for the credit would appear to already exceed one year. Thus, the BOE cost limitation of $11 might be slightly too high to encourage small refiners to make these investments. We would welcome the opportunity to work with your staffs in further developing this point.

Finally, we would prefer to see the provisions of the bill apply to expenditures for equipment after December 31, 1979, for equipment placed in service not later than december 31, 1986. We also applaud the postponement of the termination date for the energy tax credits for recycling equipment, most alternative energy and all specially defined energy property until December 31, 1986.

We appreciate the opportunity to present our testimony, and we are grateful to the persons who sponsored and helped develop this important legislative step forward.

Energy Conservation Tax Credits, Specially Defined Energy Property

The Energy Conservation Act of 1978 provided that certain "specially defined energy properties" would be eligible for an additional 10 percent tax credit. The Crude Oil Windfall Profit Tax Act of 1980 modified these provisions by the addition of one item to the list of "specially defined energy properties" and placed some additional limitations on the ability of the Secretary of the Treasury to specify additional properties.

The list of properties in the 1978 and 1980 Acts is clearly deficient so far as energy conservation equipment for refineries is concerned. With regard to small and independent refiners alone, it is possible to increase energy savings by as much as 10 percent. In terms of crude oil or its equivalent to be saved, this figure is tantamount to at least 25,000 barrels per day or one medium size tanker load of OPEC oil.

The American Petroleum Refineries Association, together with other refining groups and companies, small, medium and large, believes that the following items when used in refining facilities should be added to the list of specially defined energy properties (Section 48(1)(5) of the Code).

1. Waste heat or energy recovery improvements (including back pressure steam turbines, pressure recovery turbines, and waste heat steam generators).
2. Energy efficient pumps, compressors, electric motors, and process facilities (including retrofit trays, and improved catalysts used in reformers, hydrocracking units, desulfurization units, and catalytic crackers).
3. Improved combustion instruments (including process heater firing controls).
4. Gasoline blending optimization equipment.
5. Refinery equipment insulation.

These additions should be effective as of the effective date of the original list.

APRA Membership by State

ALABAMA

Coral Petroleum, Inc., Refinery: Cordova, Ala.
Marion Corp., Mobile, Ala., Refinery: Theodore, Ala.
Mobile Bay Refining Co., Chickasaw, Ala., Refinery: Chickasaw, Ala.

ARIZONA

La Jet, Inc., Phoenix, Ariz.

CALIFORNIA

Golden Eagle Refining Co., Inc., Los Angeles, Calif., Refinery: Carson, Calif.
Gulf States Oil & Refining Co., Beverly Hills, Calif.
La Jet, Inc., Los Angeles, Calif.
Lunday-Thagard Oil Co., South Gate, Calif., Refinery: South Gate, Calif.
Powerine Oil Co., Santa Fe Springs, Calif., Refinery: Santa Fe Springs, Calif.

COLORADO

Asamera Oil (U.S.) Inc., Denver, Colo., Refinery: Commerce City, Colo.
Wyoming Refining Co., Denver, Colo.

GEORGIA

Young Refining Corp., Douglasville, Ga., Refinery: Douglasville, Ga.

IDAHO

United Independent Oil Co., Boise, Idaho

ILLINOIS

Calumet Industries, Inc., Chicago, Ill.

INDIANA

Gladieux Refinery, Inc., Fort Wayne, Ind., Refinery: Fort Wayne, Ind.
Indiana Farm Bureau Coop Assn., Inc., Mount Vernon, Ind., Refinery: Mt. Vernon, Ind.
Industrial Fuel and Asphalt of Indiana, Inc., Hammond, Ind., Refinery: Hammond, Ind.
Laketon Asphalt Refining, Inc., Evansville, Ind., Refinery: Laketon, Ind.

IOWA

Pester Refining Co., Des Moines, Iowa

KANSAS

E-Z Serve, Inc., Refinery: Shallow Water, Kans.
Hudson Oil Co., Inc., Kansas City Kans.
Pester Refining Co., El Dorado, Kans., Refinery: El Dorado, Kans.
Pioneer Refining, Ltd., Wichita, Kans.

LOUISIANA

Bruin Refining, Inc., Refinery: St. James, La.
Calument Industries, Inc., Refinery: Princeton, La.
Canal Refining Co., Church Point, La.
Claiborne Gasoline Co., Refinery: Lisbon, La.
Consolidated Petroleum Industries, Inc., Refinery: Lake Charles, La.
Ergon Refining, Inc., Monroe, La.
Evangeline Refining Co., Inc., Jennings, La., Refinery: Jennings, La.
Hill Petroleum Co., Refinery: Krotz Springs, La.
International Processors, New Orleans, La., Refinery: St. Rose, La.
La Jet, Inc., Refinery: St. James, La.
Mt. Airy Refining Co., Refinery: Mt. Airy, La.
Placid Refining Co., Refinery: Port Allen, La.
South Louisiana Production Co., Inc., Lafayette, La., Refinery: Mermentau, La.
T & S Refining Co., Inc., Refinery: Jennings, La.

MICHIGAN

Flint Chemical Co., Detroit, Mich.
Industrial Fuel and Asphalt of Indiana, Inc., Grand Rapids, Mich.
Lakeside Refining Co., Southfield, Mich., Refinery: Kalamazoo, Mich.
Texas American Petrochemicals, Inc., Refinery: West Branch, Mich.

MISSISSIPPI

Ergon Refining, Inc., Jackson, Miss., Refinery: Vicksburg, Miss.
Southland Oil Co., Jackson, Miss., Refineries: Yazoo City, Sandersville, Lumberton.

NEW JERSEY

Seaview Petroleum Co., Refinery: Paulsboro, N.J.

NEW MEXICO

Navajo Refining Co., Artesia, New Mexico Refinery: Artesia, N. Mex.
Tonkawa Refining Co., Roswell, N. Mex.

NEW YORK

Gulf States Oil & Refining Co., New York, N.Y.

OHIO

Mt. Airy Refining Co., Cincinnati, Ohio

OKLAHOMA

Allied Materials Corp., Oklahoma City, Okla., Refinery: Stroud, Okla.
Canal Refining Co., Tulsa, Okla.
E-Z Serv, Inc., Oklahoma City, Okla.
Gulf States Oil & Refining Co., Tulsa, Okla.
Hudson Oil Co., Inc., Refinery: Cushing, Okla.
OKC Refining, Inc., Refinery: Okmulgee, Okla.
Oklahoma Refining Co., Oklahoma City, Okla., Refinery: Cyril, Okla.
Tonkawa Refining Co., Oklahoma City, Okla., Refinery: Arnett, Okla.

PENNSYLVANIA

Seaview Petroleum Co., Blue Bell, Pa.

SOUTH DAKOTA

Wyoming Refining Co., Rapid City, S.D.

TEXAS

Bruin Refining, Inc., Houston, Tex.
Carbonit Refinery, Inc.. Houston, Tex., Refinery: Hearne, Tex.
Claiborne Gasoline Co., Dallas, Tex.
Copano Refining, Inc., San Antonio, Tex.
Coral Petroleum, Inc., Houston, Tex.
Consolidated Petroleum Industries, Inc., Abilene, Tex., Midland, Tex.
E-Z Serve, Inc., Abilene, Tex.
Flint Ink Corp., Refinery: San Antonio, Tex.
Friendswood Refining Corp., Houston Tex., Refinery: Friendswood, Tex.
Guam Oil and Refining, Inc., Dallas, Tex.
Gulf Energy Refining Corp., San Antonio, Tex., Refinery: Brownsville, Tex.
Gulf States Oil & Refining Co., Houston, Tex., Refinery: Corpus Christi, Tex.
Hill Petroleum Co., Houston, Tex.
Howell Corp., Houston, Tex., Refineries: Corpus Christi, Tex., San Antonio, Tex.
Independent Refining Corp., Houston, Tex., Refinery: Winnie, Tex.
La Jet, Inc., Abilene, Tex., Dallas, Tex., Houston, Tex.
Marion Corp., Houston, Tex.
Mt. Airy Refining Co., Houston, Tex.
Navajo Refining Co., Dallas, Tex., Houston, Tex.
OKC Refining, Inc., Dallas, Tex.
Petraco-Valley Oil & Refining Co., Houston, Tex., Refinery: Brownsville, Tex.
Pioneer Refining, Ltd., San Antonio, Tex., Refinery: Nixon, Tex.
Placid Refining Co., Dallas, Tex.
Quintana Refinery Co., Houston, Tex., Refinery: Corpus Christi, Tex.
Quitman Refining Co., Houston, Tex., Refinery: Quitman, Tex.
Rancho Refining Co., of Tex., Houston, Tex., Refinery: Donna, Tex.
Saber Refining Co., Houston, Tex., Refinery: Corpus Christi, Tex.
Sector Refining Inc., Houston, Tex., Refinery: Palestine, Tex.
Sigmor Corp., San Antonio, Tex., Refineries: Three Rivers, Tex., Corpus Christi, Tex.
South Hampton Refining Co., Silsbee, Tex., Refinery: Silsbee, Tex.
T & S Refining Co., Inc., Houston, Tex.
Texas American Petrochemicals, Inc., Midland, Tex.
Texas Armada Refining Co., Euless, Tex., Refinery: Fort Worth, Tex.
Tipperary Refining Corp., Midland, Tex., Refinery: Ingleside, Tex.
Wyoming Refining Co., Houston, Tex.

UTAH

Little America Refining Co., Salt Lake City, Utah

WASHINGTON

United Independent Refining Corp., Refinery: Tacoma, Wash.

WYOMING

Johnson Oil Co., Inc., La Barge, Wyo., Refinery: La Barge, Wyo.
Little America Refining Co., Refineries: Evansville, Wyo., Cheyenne, Wyo.
Wyoming Refining Co., Refinery: Newcastle, Wyo.

ASSOCIATE MEMBERS

Alexander & Alexander, Inc.
Dalco Petroleum Co.
E. I. Dupont de Nemours & Co.
Englehard Minerals & Chemicals Corp.
Ethyl Corp.
Fedco Oil Co.
Fields Energy Resources, Inc.
First City National Bank of Houston.
Home-Baker Engineers, Inc.
Mellon Energy Products Co.
Minro Oil, Inc.
Nalco Chemical Co.
The Ortloff Corp.
Oxirane Corp.
PPG Industries, Inc.
The Quarles Agency, Inc.
Statio Terminals, N.V.
West Texas Marketing.

Senator WALLOP. The hearing stands adjourned.

[Whereupon, at 1:25 p.m., the hearing was adjourned, subject to the call of the Chair.]

[By direction of the chairman the following communications were made a part of the hearing record:]

STATEMENT OF HON. RICHARD L. OTTINGER

Mr. Chairman and members of the committee, it is a privilege to testify before you on a subject of great interest and concern to me: industrial energy conservation. The bill you have before you for consideration today, S. 3006 introduced by Senator Wallop, is an important step toward tapping the enormous potential for cost-effective energy production in our nation's energy-intensive factories. The bill has my strong support. I have cosponsored with Congressman Heftel of Hawaii a similar bill on the House side, the Industrial Energy Conservation Investment Tax Act of 1980 (H.R. 8177).

Mr. Chairman, the current hostilities between Iran and Iraq, which threaten to cut off the world's most vulnerable supply of oil, have dramatized once again the need to free ourselves as quickly as possible from dependence on OPEC oil. Clearly, one of the fastest, most cost-effective ways to supply domestic energy resources is to exploit the energy efficiency gains that could be made in industrial operations. Industry currently accounts for about 36 percent of the nation's energy use. Through energy conservation investments that are currently economic to the nation, industry could reduce its energy use by 20 to 30 percent, according to Robert Stobaugh and Daniel Yergin, authors of the Harvard Business School study, Energy Future. Such a reduction in energy use could free up the equivalent of as much as 4.5 million barrels of oil per day, almost equalling our current total OPEC exports of 4.6 million barrels per day.

If these investments are so attractive, we have asked, why is industry not making them right now? There are numerous reasons. While many conservation investments may appear economic to a nation facing rising world oil prices, expensive synthetic fuel alternatives and national security threats, industry still pays a price for energy that does not reflect those concerns. While a company is purchasing average barrels of oil at $35, Stobaugh and Yergin calculate that the nation is paying from $60 to $100 per barrel for the additional oil we have imported since 1975. In tallying the marginal cost of these barrels, the authors have taken into account the impact of these additional imports on the world market and accompanying inflationary and GNP losses.

Yet even at a cost of $35 per barrel of oil or less, we find that industry is not making many extremely economic energy conservation investments. One reason we have heard many times is that industry prefers to invest in those areas where it is most knowledgeable: increasing market share or producing new products. Sometimes a company will demand a higher rate of return—or faster payback—from a conservation investment than it will from investments in those areas with which it is most familiar.

Finally, there is the fact that industry, having made many of the low-cost housekeeping improvements in its energy use is now faced with energy-saving investments that will require massive amounts of capital. The scale of this capital requirement is apparent when one considers that most of the nation's existing industrial stock was built at a time when oil cost only $2 per barrel.

The incentive proposed in the bill introduced by Senator Wallop—and in the House measure I have cosponsored—is aimed at helping industry to overcome the capital supply problems it faces when deciding whether to make an energy conservation investment. The bill would encourage only those investments that are cost-effective to the nation when compared to such alternative energy sources as synthetic fuels. In addition to its energy-saving benefits, this legislation has significant implications for the economy. By helping industry to reduce the rising energy cost component of manufactured goods, this measure should help to improve industrial productivity and to dampen the inflationary effects of rising energy costs.

I should add that most of the energy efficiency improvements we are talking about do not involve radically new technology. A look at foreign countries is a good indication of what could be done today. The United States currently uses 50 percent more energy than Italy to produce a ton of steel. The United States uses 45 percent more energy than West Germany to produce the same amount of cement.

The hurdles in the way of increasing industrial energy efficiency have interested me for quite some time. My Subcommittee on Energy Development and Applications

of the House Science and Technology Committee has heard numerous witnesses from industry and the academic community describe the kinds of financial problems I have discussed in my testimony. The Subcommittee sponsored a workshop on industrial energy conservation in June to learn more about the potential for industrial energy conservation and possible government solutions. In each instance, my conclusion has been that there is an important role for the government to play in bridging the gap between industry's approach to energy use and the national need. In most cases we are talking about accelerating investments that industry would make eventually but not quickly enough to respond to the national imperative of freeing ourselves from dependence on foreign sources of energy supply.

I urge you to support this legislation.

WRITTEN STATEMENT OF THE COGENERATION COALITION, INC.
ON THE INDUSTRIAL ENERGY EFFICIENCY AND FUEL CONVERSION
TAX INCENTIVE ACT (S.3006)
BEFORE THE
SENATE FINANCE SUBCOMMITTEE ON TAXATION AND DEBT MANAGEMENT
October 17, 1980

The following written statement for the record is filed on behalf of the Cogeneration Coalition, Inc. on the Industrial Energy Efficiency and Fuel Conversion Tax Incentive Act of 1980 (S.3006). This bill, which was introduced by Senator Malcolm Wallop, was the subject of hearings before this Subcommittee on September 29, 1980.

The Cogeneration Coalition, Inc. is a non-profit organization comprised of interested public utilities, industrial users, industrial equipment manufacturers, and engineering consulting firms. Advisory relationships have also been established by the Coalition with other public interest and environmental groups. The Coalition supports the provision of necessary financial and tax incentives to promote the utilization of cogeneration resources and the removal of unnecessarily restrictive federal barriers to the development of cogeneration potential nationwide.

Introduction

The Cogeneration Coalition conceptually supports the objectives of the Industrial Energy Efficiency and Fuel Conversion Tax Incentive Act of 1980 recently introduced by Senator Wallop. This bill as well as other legislative proposals */ currently before the Senate and the House provides

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*/ E. g. H.R.7505, H.R.8257, H.R.____(Discussion draft-Industrial Energy Productivity Act.)

an important opportunity to focus on the major issues associated with the development of increased energy efficiency capabilities within industry. This bill recognizes the continual need to promote energy efficiency in industry, while recognizing the important contribution made by industrial energy conservation activities since the Arab oil embargo.*/ These industrial activities over the past seven years have been relatively less capital-intensive than projected capital requirements for increasing energy efficiency within industry during the upcoming decade. These capital requirements will be substantial and this legislation establishes an important correlation between an awareness of the capital-intensity of such projects, and the need to provide appropriate financial incentives to encourage the pursuit by industry of energy efficiency investments.

This legislation also implicitly recognizes the public interest benefits of decontroling both oil and natural gas for industrial users. Decontrol will operate to send appropriate price signals to the marketplace to promote additional energy efficiency investments, while encouraging increased domestic production of indigenous fossil fuel supplies. However, the bill recognizes that even with the development of these price signals posed by the pending deregulation of domestic oil by September 30, 1981, and the phased deregulation of new natural gas by January 1, 1985, the need exists for promoting a better environment for industrial investment decision-making with respect to energy efficiency improvements. Currently, these types of investments suffer from debilitating

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*/ During 1973 through 1978, industrial energy use decreased by 12% per unit of output, while residential and commercial use increased 1% per capita.

constraints with respect to clearing financial hurdle decision-making within industrial corporations.*/ This type of legislation which focuses on the need for necessary tax incentives promotes a better capability for such investments to be carefully considered in the financial decision-making process within industry.

Further, the Coalition finally notes that this legislation must also be comparatively assessed with other critical Congressional work on the subject of industrial energy efficiency. Senator Packwood, and Representatives Ottinger, Heftel and Fisher are also working on legislation to create a conducive environment for such investments utilizing both tax and non-tax approaches. As these different legislative approaches evolve over the next several months, S.3006 must be comparatively assessed with policy development and analysis provided by these other key leaders in the Congress with respect to the development of comprehensive industrial energy efficiency legislation.

The Conceptual Approach of S.3006 is Sound

The Coalition supports the need for broad-based capital cost recovery allowances for industry and increased energy investment tax credits to make necessary capital available for energy efficiency improvements. In this respect, the Coalition strongly supports current consideration of modifications to the capital cost recovery system in the Internal Revenue Code. The 10-5-3 asset depreciation proposals **/ represent a constructive policy approach to this issue, while fully recognizing the importance of the initial work conducted on this issue by the Senate Finance Committee in

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*/ These constraints have been recently exacerbated by increasing inflation, the recession, tight money supply policies and the national shortage of capital availability.

**/ HR.4646, S.1435

its recent markup of the Tax Reduction Act of 1980 */ to modify this important element of national tax policy.

S.3006 specifically emphasizes the need for additional tax incentives through use of the energy investment tax credit to promote necessary business investment in energy efficiency improvements. This represents awareness of the sound public policy incorporated in using tax credits to promote in the short-term desirable public response to the world energy crisis. This was most recently recognized by Mr. Yergin and Stobaugh, the co-editors of Energy Future:

> "Tax or other policies that promote investment in new facilities will speed energy conservation. ...Significantly greater tax credits, up to 40%, plus accelerated depreciation, or direct financial payments are required."**/

This viewpoint was also expressed by the Joint Economic Committee which emphasized the importance of tax credit approaches for energy efficiency investments. As the Committee concluded:

> "Both to encourage the development and use of more energy efficient equipment and to provide an incentive to invest in energy-producing equipment, the investment tax credit should be increased.***/

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*/ H.R.5829

**/ 126 CONG. REC. S10569, at 10570 (daily ed. August 1, 1980)

***/ Joint Economic Committee, Energy and Materials: A Shortage of Resources or Commitment?, August, 1980, p.36.

Cogeneration Needs to be More Effectively Incorporated Into S.3006

The Cogeneration Coalition is extremely concerned that S.3006 as drafted may inadvertantly preclude qualification of critical cogeneration investments for the increased business energy tax credit. Cogeneration offers the capability of displacing up to 945,000 barrels of oil per day equivalent by the year 2000 through use of energy technology that is currently available to promote increased energy efficiency with industry.*/ The Energy Information Administration recently characterized cogeneration as the second largest contributor to industrial energy requirements by the year 2000 only exceeded by use of biomass energy technology and resources.**/ These projections are important since they clearly indicate the projected role and capabilities of cogeneration in industry into the next century.

However, current tax policy with respect to cogeneration tax investments is deficient as embodied in the recent cogeneration energy tax credit provided in the Crude Oil Windfall Profit Tax Act of 1980.***/ The credit is limited to just existing facilities, may not provide a sufficient level of incentive for inducing industrial investment in such facilities, and is severely restricted with respect to cogeneration facilities using fuels other than coal.

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*/ General Accounting Office, Industrial Cogeneration-What It Is, How It Works, Its Potential (EMD-80-7), April 29, 1980, p.41. This energy saving projection represents approximately 2 quads of energy, resulting in a reduction of energy use of 1.7% by the year 2000.

**/ Energy Information Administration, Annual Report to Congress-1979 (Volume III), pp.175-77.

***/ P.L. 96-223, Section 222(f) amending Section 48(1) of the Internal Revenue Code of 1954.

In this regard, the Cogeneration Coalition has previously expressed concern in the drafting of statutory language for S.3006 which was the subject of these hearings. The potential problem exists in the drafting of the definition of qualified industrial energy property which could potentially exclude investments in cogeneration equipment from qualifying for the proposed 20% energy investment tax credit under the bill.

The bill contemplates the calculation of the amount of energy used per unit of output by the facility, commercial or industrial process, or item of equipment. This methodology could specifically exclude co-generation equipment unless it is modified. Such modification should reflect a reduction of the difference between the amount of cogenerated energy produced per unit of output by the cogeneration equipment, and the amount of cogenerated energy produced per unit of output by the equipment that it modified or replaced. This proposed modification would more closely recognize that the use of cogeneration equipment constitutes a more efficient use of the primary energy source input into the industrial facility's energy system.

The Cogeneration Coalition recommends consideration of a special rule governing cogeneration equipment under the proposed energy investment tax credit for qualified conservation property in this bill. Such special rule should incorporate the modification previously discussed, and also define cogeneration equipment to include equipment that sequentially produces electrical or mechanical energy and another form of useful energy (such as steam or heat) from the same energy source. We are providing as Attachment 1 to this statement a proposed draft of a special rule for cogeneration equipment for consideration by this Committee in its review of S.3006.

Otherwise, one of the major short to mid-term energy efficiency investments available to industry could be effectively precluded by the current provisions of S.3006 as drafted. This would be contrary to current national energy policy objectives with respect to cogeneration as recently provided in the PURPA requirements for cogeneration facilities as implemented by the FERC.*/ Further, awareness of the potential for cogeneration has been recently expressed by the Department of Energy in its recent policy program **/ with respect to utility conservation, and its interest in developing a broad data base for cogeneration applications over the next year.

Other Cogeneration Tax Incentives Should Be Considered

The Cogeneration Coalition would also recommend that this Committee carefully review and reconsider other potential deficiencies of the current cogeneration tax credit provided in the recently enacted Crude Oil Windfall Profit Tax Act of 1980. These concerns were most recently expressed by Senator Robert Packwood in a recent floor statement inserted into the Congressional Record.***/ This statement indicates the desirability of re-examining the following key provisions of the cogeneration tax credit at this time:

- The potential for modifying the definition of cogeneration equipment to ensure that mechanical cogeneration qualifies for this tax credit, as well as cogeneration equipment that uses energy sources such as solar, biomass, and geothermal

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* See Sections 201 and 210 of the Public Utility Regulatory Policy Act of 1978 (P.L. 95-617) as implemented by the FERC in Orders 69 and 70.

**/ Department of Energy, Encouraging Utility Use of Cogeneration and Renewable Energy Resources, August, 1980.

***/ 126 CONG.REC. S14189 (daily ed. October 2, 1980); see also 126 CONG. REC. S9366-et. seq. (daily ed. July 2, 1980).

energy. Thus, cogeneration equipment should be defined as equipment for the sequential production of electrical or mechanical energy, and another form of useful energy (such as steam or heat) from the same energy source.

- The business energy tax credit for cogeneration equipment should be made available for oil and gas-fired equipment installed in a cogeneration facility that qualifies for an exemption from the prohibitions of the Powerplant and Industrial Fuel Use Act of 1978.
- The current exclusion against public utilities qualifying for the business energy tax credit for cogeneration equipment should also be re-examined for property characterized as "public utility property."
- The Department of Treasury should be required to promulgate proposed regulations to implement these modifications within 90 days after the date of enactment, and to promulgate final regulations within 270 days after the date of enactment of such provisions.

The Coalition particularly emphasizes the need to carefully examine the Congressional position taken with respect to oil and gas-fired cogeneration. As the Federal Energy Regulatory Commission has recently stated:

> "[It] believes that the legislative history, Congressional intent, and national energy policy support the use of oil and gas in cogeneration facilities."*/

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*/ Order Granting in Part and Denying in Part Rehearing of Order Nos. 69 and 70, and Amending Regulations, May 15, 1980, mimeo at 23.

There needs to be an awareness developed of the potential efficiency improvements with respect to using cogeneration in oil and gas-fired facilities. This consideration should proceed on the assumption that an improved, more efficient use of oil and gas in these facilities should be promoted and encouraged in those situations where complete prohibitions on oil or gas use are not appropriate nor practical, such as where the cogeneration exemptions under the Fuel Use Act are directly applicable. Further, consideration should be granted to small and medium-sized cogeneration facilities more likely to use oil or natural gas, since the rate of return on capital investment for coal-burning facilities is generally prohibitive. Thus, at least the continued use of oil and gas in such facilities can proceed in an environment where more efficient utilization of these scarce fossil fuel resources can be fostered and promoted. This was also characterized by the Environmental Policy Center */ in its testimony on S.3006 as a critical area for consideration in this Committee's deliberations.

Conclusion

The Cogeneration Coalition, Inc. supports this Committee's efforts to focus attention and discussion on the need for business energy efficiency incentives. In this regard, we strongly support the Subcommittee's leadership in focusing attention on this issue, and respectfully hope that these efforts will continue on an accelerated

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*/ Statement of William A. Chandler, Environmental Policy Center, on S.3006, September 29, 1980, pp.8-9.

timetable at the start of the 97th Congress. In that regard, the Coalition stands ready to commit its resources to working with this Committee in the fashioning of necessary industrial energy efficiency tax legislation for consideration by the Congress.

An important step has been taken by this Committee. Continuing efforts will be necessary to fully promote awareness and recognition of the role of energy efficiency improvements by industry as a critical component of overall national energy policy objectives. The Coalition submits that cogeneration is an important near and mid-term energy efficiency initiative that should not be overlooked by the Committee during its ongoing deliberations.

Respectfully submitted,

Michael J. Zimmer

Counsel, Cogeneration Coalition, Inc.

Attachment 1

Special Rules for Cogeneration Equipment

(i) For purposes of this section, in the case of cogeneration equipment, the amount of energy used per unit of output shall be reduced by the amount of cogenerated energy produced per unit of output by the cogeneration equipment.

(ii) Cogeneration equipment defined -- the term "cogeneration equipment" means equipment for the sequential production of:

1. electrical or mechanical energy, and
2. another form of useful energy (such as steam or heat)

from the same energy source.

American Iron and Steel Institute

1000 16th Street N.W., Washington, D.C. 20036

Robert B. Peabody
President
(202) 452-7146

The Honorable Russell Long
Chairman, Committee on Finance
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

This letter is submitted by the American Iron and Steel Institute for inclusion in the Finance Committee's record of the hearings on S. 3006--the Industrial Energy Efficiency and Fuel Conservation Tax Incentive Act of 1980. A copy of this letter is being sent to each member of the Committee.

The 63 domestic members of the American Iron and Steel Institute (AISI) are involved in all aspects of the iron and steel industry. In 1979, AISI member companies produced 93 percent of the raw steel made in the United States and employed 453,000 people.

SUMMARY

The steel industry is one of the nation's largest energy consumers. Within the industry, there are substantial opportunities to save energy through energy conservation, waste heat utilization, and the increased use of energy sources other than oil and gas. As this Committee again begins to consider legislation to provide tax incentives for energy conservation and the development of alternative sources of energy, careful consideration should be given to the need for incentives to encourage those investments which will reduce energy consumption in the steel industry.

S. 3006 generally represents an important step toward the development of a meaningful program of tax incentives for energy conservation in all industries--including the steel industry. However, the impact of certain aspects of the bill on the iron and steel industry does not appear to have been fully appreciated. Accordingly, AISI is submitting these comments and recommendations regarding S. 3006. If S. 3006 is modified to reflect these recommendations, it could lead to significant energy savings in the iron and steel industry.

ENERGY USE AND ENERGY CONSERVATION IN THE IRON AND STEEL INDUSTRY

The iron and steel industry is the second largest industrial energy consumer in the United States. During the period from 1972 through 1978, the industry consumed an average of more than 3 quads[1/] each year. This represents more than 4.2 percent of all direct energy consumption in the United States during that period. More than two thirds of the energy consumed by the steel industry is derived from coal. 20 percent of the industry's energy comes from natural gas, and 8 percent comes from petroleum products. The remaining energy needs--about 5 percent of the total--are satisfied with purchased electricity.

Since 1950, energy consumption in the industry has declined from an average of 43 million BTUs per ton of finished steel to an average of

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1/ A quad is equal to one quadrillion BTUs.

31 million BTUs per ton. This represents an overall reduction in energy consumption of almost 28 percent, or the equivalent of more than 2 barrels of oil per ton of finished steel.[2/] Recent studies have concluded that there is still a significant potential for further reducing energy consumption by the steel industry.[3/] These studies indicate that the increased practice of techniques such as continuous casting, and combustible gas and waste heat recovery could result in substantial additional energy savings. However, the realization of these energy savings will require substantial capital investments by members of the industry.

Capital availability is a major constraint on the steel industry's ability to invest in new equipment, including equipment which will reduce the amount of energy used in the steel making process. As AISI has previously testified before this Committee,[4/] depreciation reform such as is currently being considered by Congress is urgently needed to stimulate capital formation and investment throughout the industrial sector. Indeed, AISI feels that depreciation reform should be accorded the highest priority by this committee and by the entire Congress. However, in addition to general measures to improve the climate for capital formation and investment, Congress should also provide specific tax incentives to encourage energy conservation and the development of alternative sources

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2/ One barrel of oil is equal to 5.8 million BTUs.

3/ See, for example, Research, Development and Demonstration for Energy Conservation: Preliminary identification of opportunities in iron and steelmaking, Arthur D. Little, Inc., January 1978.

4/ See the testimony of William J. DeLancey before the Finance Committee on July 31, 1980.

of energy. Such incentives would insure that energy-related investments are accorded the highest possible priority by industrial companies as they evaluate the merits of potential investments. A recent study published by the Department of Energy has concluded that without significant government incentives for energy related investments, few programs with large energy saving potential will be undertaken within the steel industry.5/

IMPACT OF S. 3006 ON THE STEEL INDUSTRY

S. 3006 would provide a 20 percent non-refundable energy tax credit (in addition to the regular 10 percent investment tax credit) through the end of 1986 for certain items of energy property. The credit would be available for property which is currently included in the category of alternative energy property under Section 48 (l)(3)(A) of the Code (other than geothermal and ocean thermal property), or in the category of specially defined energy property under Section 48 (l)(5). In addition, the credit would be available for a new category of energy property--"qualified industrial energy property."

As defined in S. 3006, qualified industrial energy property is property which modifies or replaces equipment used in an existing manufacturing, production or extraction facility; which does not increase the amount of oil or gas used per unit of output; and which either results in the use of less energy per unit of output or permits the use of an energy source other than oil or gas. Eligible equipment must be an integral part of

5/ See Research, Development, and Demonstration for Energy Conservation, supra, p. I-2.

the manufacturing, production or extraction process. The new credit for conservation property would not be available if the credit would be less than eleven dollars per barrel of oil saved during a representative one-year period, and would be subject to a maximum of 55 dollars per barrel of oil saved during that period.

S. 3006 represents an important and commendable step toward the development of a program of meaningful incentives for industrial energy conservation. S. 3006 would extend the energy tax credit to all investments which either conserve energy or permit the use of energy sources other than oil or natural gas--rather than limiting the credit to a specifically enumerated list of items of equipment, as is the practice under current law. Accordingly, it would provide a significant incentive for energy-related investments, while at the same time allowing specific investments to be determined by free market operations, and not by the presence or absence of a particular item of equipment on a narrow list of "qualifying property."

While S. 3006 is generally a well conceived and highly desirable proposal, it contains several features which could diminish its impact on the steel industry. One of the most important shortcomings of the bill is that the new energy tax credits would not be refundable. Because of low profits in recent years, many steel companies have accumulated large amounts of unused investment credits. Unless the new energy credits are refundable, many of these companies will be unable to benefit from the

credits—now or in the future—and the credits will not have the desired impact on steel company investments. The credits provided under the counterparts to this bill that have been introduced in the House of Representatives (H.R. 8177 and H.R. 7505) would be refundable. AISI urges this committee to include a similar feature in S. 3006.

In addition to the non-refundability of the credit, there are several other specific aspects to S. 3006 which are of concern to the steel industry:

1) Replacement equipment

Under S. 3006, qualified industrial energy property does not include any property which replaces existing property unless the replaced property is retired from service (except for temporary use while the replacement equipment is inoperable). However, there are circumstances under which, notwithstanding the installation of energy saving replacement equipment at an existing facility, it may not be possible to completely retire the existing equipment. For example, it may be necessary to continue to use the existing equipment because the replacement equipment does not have as much capacity as the existing equipment, or because it cannot be used to make all of the products that were made by the existing equipment. Unfortunately, because the retirement rule is extremely broad, it would deny the new energy tax credit to many items of equipment which should qualify for the credit.

Continuous casters are an example of the kind of energy saving equipment in the steel industry which could be adversely affected by the

retirement rule. Continuous casters process molten steel into semi-finished products in a single operation. They replace a number of energy consuming steel mill processes, including soaking pits and primary breakdown mills. It has been estimated that continuous casting results in energy savings of as much as 3 million BTUs per ton of cast steel--the equivalent of more than one half of a barrel of oil per ton. This represents almost 10 percent of the total energy used to make finished steel products. However, continuous casters cannot be used for all grades of steel. Moreover, a single continuous caster may not be able to process as much steel as was previously processed by the steel mill's ingot casting and rolling equipment. Accordingly, even if a continuous caster is installed at an existing mill, it may be necessary to continue to use the existing equipment for a portion of the mill's output.

Under the retirement rule, continuous casters and other items of replacement equipment which would otherwise be eligible for the new energy credit but which cannot completely replace the existing equipment at a facility would be ineligible for the credit. This would substantially diminish the impact of the new credit on precisely those investments that it is designed to encourage. The House versions of this bill do not contain a retirement rule. Because of its potential exclusionary impact, the test should be dropped from S. 3006 as well.

2) Direct result test

Under S. 3006, qualified industrial energy property must "directly" result in the use of less energy or the conversion to the use of an alter-

native source of energy. See proposed Section 44F(c)(2)(E). This limit could present substantial interpretative problems once the bill is enacted because there is no standard provided in the bill for distinguishing a direct energy savings from an indirect energy savings. Moreover, if the interpretation of this test is left to the IRS, it could be so narrowly construed that it would diminish the overall impact of the new credit.

Continuous casters are an example of the kind of equipment whose eligibility for the credit could be affected by the direct result test. Continuous casters directly consume an average of 1,010,000 BTUs per ton of steel cast, as compared with conventional ingot casting and rolling equipment, which consumes an average of 2,650,000 BTUs per ton.6/ Presumably, if a continuous caster is installed in an existing mill, the difference in direct consumption--1,640,000 BTUs per ton--would be considered a direct result of the use of the caster. However, continuous casters also produce more finished steel per ton of molten steel because the yield of a continuous caster is higher than the yield of conventional mill equipment. This increased yield in turn results in further energy savings, because it reduces the amount of energy which must be used in a steel furnace to produce each ton of finished steel. Unfortunately, it is not clear whether this would be considered a "direct" energy saving for purposes of the new energy tax credit. This ambiguity should not affect the threshold

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6/ See Research, Development and Demonstration for Energy Conservation, supra, p. VIII-1.

qualification of a continuous caster for the new credit because, as indicated above, at least some of the energy savings that result from the use of continuous casters should be considered to be direct savings. However, if the additional energy savings that result from reduced yield loss are not considered, it could affect the amount of the credit by affecting the capital cost of each barrel of oil equivalent saved by the equipment.

Qualified industrial energy property should include any property which results in the use of less energy or the conversion to the use of an alternative substance, and not just property which directly results in energy savings or conversion. As a matter of sound energy policy, any energy savings--direct or indirect--should be encouraged by this credit. Moreover, if the "direct result" requirement is left in the bill, the IRS could use that requirement to restrict the scope of the credit far beyond the intent of Congress--as they did in drafting the proposed regulations on the Energy Tax Act of 1978. Accordingly, the "direct result" test should be deleted from S. 3006.

3) Integral part test

Under S. 3006, qualified industrial energy property must be "used as an integral part of manufacturing, production or extraction." See proposed Section 44F(c)(2)(A). This rule is similar to the rule which restricts the availability of the regular investment tax credit for real property improvements under current law. This restriction has generally been interpreted very narrowly by the IRS, and has generated a substantial amount of litigation. Moreover, the courts have frequently refused to

accept the narrow construction of the term advanced by the IRS. See, for example, Spartanburg Terminal Co., 66 T.C. 916 (1976); Dolph Spalding, 66 T.C. 1017 (1976).

For purposes of the regular investment credit, property is an integral part of an activity if it is used directly in the activity and is essential to the completeness of the activity. See Reg. § 1.48-1 (a)(4). The narrow interpretation of this provision by the IRS is demonstrated by a recent private ruling (Letter Ruling No. 8005017). In that ruling, the IRS ruled that a hydroelectric dam owned by a cotton manufacturer and used to provide electricity for the manufacturer's cotton mill was not eligible for the regular investment tax credit because it was not an integral part of the cotton manufacturing process. The IRS concluded that the hydroelectric dam was not essential to the completeness of the manufacturing process because electric power had in the past been purchased from a local utility and could be purchased from the utility in the future. If similar reasoning is applied to the integral part requirement contained in S. 3006, it could result in the loss of energy tax credits for several types of equipment which the bill is designed to encourage.

This rule could have a direct impact on energy recovery projects in the steel industry. One way to reduce energy waste in the steel making process is to use the pressure in blast furnace exhaust gas to generate electricity. Modern blast furnaces operate under 30 to 45 PSI of pressure, and gases leaving the top of such a furnace could be expanded through a turbine, which in turn could drive an electric generator. The resulting

electricity could then be used in other parts of the steel mill to replace some of the electricity which is now purchased from outside sources. However, under the IRS' reasoning in Letter Ruling No. 8005017, the generation of electricity would not be considered to be an integral part of the steel making process. Accordingly, even though the electric generating equipment would satisfy the other requirements for the credit, since it would reduce the net amount of purchased electricity used by the steel mill,7/ the IRS may well take the position that the credit is not available for the generating equipment because it is not an integral part of the steel making process.

It would be a mistake to draft any new energy legislation to include a requirement which has forced taxpayers to litigate so frequently in the past, particularly since the courts have on several occasions expressly refused to accept the IRS' narrow interpretation of the requirement. The IRS position in Letter Ruling No. 8005017 is a clear indication that similar controversies could arise in connection with precisely those investments which this bill is designed to encourage. Neither of the House versions of this bill limit the credit to equipment which is an integral part of a manufacturing, production or extraction process. The "integral part" requirement should be deleted from S. 3006 as well.

7/ It is assumed that this is the correct result as the bill is drafted. If it is not, the bill should be clarified to indicate how self-generated electricity will be treated for purposes of the credit.

4) Definition of Alternative Substance

Under S. 3006, equipment installed at an existing industrial facility would be eligible for the credit as qualified industrial energy property if it does not increase the amount of oil and natural gas used by the facility and results in the use by the facility of an alternate substance as a fuel or feedstock. The term "alternate substance" is defined in the bill as any substance other than oil, natural gas or a product of oil or natural gas. Thus, the bill is apparently designed to provide a credit for, among other things, equipment which recovers combustible gas generated during industrial processes and which makes this gas available for use as a fuel or a feedstock. However, the IRS' interpretation of the Energy Tax Act of 1978, as announced in its proposed regulations on that act, suggests that it would take the position that a credit is not available for such equipment under S. 3006.

The Energy Tax Act of 1978 provided an energy tax credit for several types of "alternative energy property"--a category of property generally consisting of equipment that uses an alternate substance as a fuel or feedstock. The definition of the term "alternate substance" under the Energy Tax Act of 1978 was substantially the same as the definition contained in S. 3006: it was defined as any substance other than oil, natural gas, or a product of oil or natural gas. However, in its proposed regulations implementing the Energy Tax Act of 1978, the IRS has taken the position that synthetic fuels and other products that are produced from an alternate substance and that have undergone a chemical change during the

course of their production are also excluded from the category of alternate substances. This position is completely contrary to the expressed language, the legislative history, and the underlying policy of the Energy Tax Act. Nevertheless, if this position is included in the final regulations, it will disqualify many items of equipment which would otherwise be eligible for the energy tax credit under current law. Moreover, if the IRS takes a similar position regarding the energy tax credit which would be provided by S. 3006, many items of equipment which would otherwise be eligible for the credit would likewise be excluded.

An example of the kind of equipment which could be adversely affected if the IRS adopts a narrow interpretation of the term "alternate substance" as it is used in S. 3006 is equipment to recover Basic Oxygen Furnace (BOF) off-gas. Most of the oxygen used in a BOF (as much as 1440 SCF per ton of steel) is used to oxidize the carbon in the hot metal to produce carbon monoxide, which is expelled as off-gas. Presently, BOF off-gas is simply flared. However, it is estimated that BOF off-gas having a fuel value of up to 500,000 BTUs per ton of steel could be recovered and used to replace natural gas or oil used in the steel mill.8/

Combustible gas recovery equipment--such as equipment to recover BOF off-gas--is precisely the kind of equipment which S. 3006 is designed to encourage, since it will permit the substitution of gas derived from an alternate substance (in this case, coal) for oil and natural gas. However,

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8/ See Research, Development and Demonstration for Energy Conservation, supra, p. VII-21.

if the IRS interprets S. 3006 in the same way that it has interpreted the Energy Tax Act of 1978, this equipment would not be eligible for the credit, since BOF off-gas is a chemically altered product of an alternate substance, and would not be considered to be an alternate substance itself. In order to avoid this result, S. 3006 should be revised to clarify that the term "alternate substance" includes any substance other than oil or gas, and not merely virgin materials. Moreover, this clarification should be made in a way that could not be construed to imply that the IRS' interpretation of the Energy Tax Act of 1978 was correct.

5) Qualification of equipment which permits the use of an alternate substance as a fuel

S. 3006 would extend an energy tax credit to equipment which results in the conversion of an existing facility, process, or item of equipment "to permit the use of an alternate substance as a fuel or feedstock." The obvious intent of this portion of the bill is to encourage the conservation of oil and gas. However, it is not clear under this provision whether replacement equipment which merely increases the existing use of an alternate substance or which decreases the use of oil or gas without directly substituting an alternate substance for the oil or gas would be eligible for the credit. In order to provide an incentive to the greatest possible variety of oil and gas conserving equipment, the credit should be available for any equipment which "permits the increased use of an alternate substance as a fuel or feedstock or the decreased use of oil or natural gas as a fuel or feedstock."

An example of an item of steelmaking equipment which might not be eligible for a credit without the suggested modification of the statute is the Basic Oxygen Furnace, which can be installed at existing steel mills to replace open hearth furnaces. BOFs consume, directly and indirectly, 20.28 million BTUs per ton of steel produced--less than 5 percent more energy than is used by open hearth furnaces. However, BOFs use no oil--as compared with 1,350,000 BTUs per ton of steel used by open hearth furnaces. BOFs also use considerably less natural gas--200,000 BTUs per ton of steel, as compared to 1,130,000 BTUs per ton used by open hearth furnaces. These savings may be offset by a slight (160,000 BTUs per ton) increase in the use of electricity, which may or may not be produced from critical fuels. Nevertheless, even if the critical fuel savings are offset by the increased electricity use, the installation of a BOF to replace an open hearth furnace would result in a net saving of critical fuels of at least 2,120,000 BTUs per ton of steel--the equivalent of more than a third of a barrel of oil per ton.9/

Basic Oxygen Furnaces result in substantial savings of critical fuels. However, it is not clear whether a BOF which replaces an open hearth furnace would qualify for the credit under S. 3006 as it now stands. The BOF only indirectly increases the use of coal, by increasing the amount of hot metal used to produce each ton of steel.10/ Moreover, while a BOF reduces oil and

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9/ Final Report to FERC on Potential for Energy Conservation in the Steel Industry, Battelle Columbus Laboratories, 1976, pp. A-2, A-3.

10/ As indicated above, it would be helpful if S. 3006 were revised to exclude the requirement that the energy saving or fuel conversion be a direct result of the investment. Such a revision would help to resolve the status of BOFs under the bill.

gas consumption by more than 80 percent, it does not completely eliminate the use of oil or gas. Accordingly, to insure that BOF's and similar items of equipment qualify for the new credit, the credit should be extended to any equipment which either increases the amount of alternate fuels used or decreases the amount of oil or gas used by the facility.

6) Existing process

Under S. 3006, qualified industrial energy property must be installed in connection with an existing facility, process or item of equipment. This limitation is apparently designed to confine the credit to investments which replace or modify equipment which is already in use, and to deny the credit for investments in completely new plants or processes. However, the IRS' interpretation of a similar limitation contained in the Energy Tax Act of 1978 suggests that this aspect of S. 3006 could be applied in a much more restrictive manner than is consistent with the purpose of the bill.

The Energy Tax Act of 1978 provided a 10 percent energy tax credit for certain items of energy property installed in connection with an industrial or commercial process which was in existence on October 1, 1978. In the proposed regulations implementing the Energy Tax Act, the IRS has taken the position that a process is not an existing process for purposes of the credit if any capitalizable expenditures have been incurred to modify the process after October 1, 1978. Presumably, ordinary repairs and maintenance would not affect the status of a process even if they must be capitalized for tax purposes, provided that they

do not alter the process in any way. However, under this test, the credit would not be available for equipment installed in connection with an existing process which has been modified to any extent by a capitalizable expenditure. This is an unnecessarily restrictive rule, since it would deny the credit to items of equipment installed in connection with processes which have been modified to a relatively slight extent, or which have been modified in a manner that is wholly unrelated to the energy consumption of the process. If the IRS interprets S. 3006 in a similar manner, the impact of that bill could be substantially diminished. Accordingly, S. 3006 should be modified to provide a more reasonable definition of existing processes. Moreover, this modification should also be made in a way that could not be construed to imply that the IRS interpretation of this aspect of the Energy Tax Act of 1978 was correct.

7) Technical comments

In addition to the substantive comments set forth above, there are several technical aspects of the bill which are of concern to the steel industry:

A. Carryover period and effective date. Under S. 3006 the credit for "qualified industrial energy property" may only be carried back for three years or forward for one year. By contrast, the energy tax credits that are available under current law may be carried forward for seven years or back for three. As indicated above, this credit will not achieve its maximum impact on the steel industry unless it is refundable. However,

at the very least, the same carry-forward period should apply to the new energy tax credit as applies to the energy tax credits that are available under current law.

Another difference between S. 3006 and current law is that under S. 3006, the credit is available only for property which is acquired after July 31, 1980 or whose construction is commenced after that date. The energy tax credits that are available under current law are available for property whose construction is completed after the effective date (but only to the extent of the basis of the property attributable to construction after the effective date). Any new credits should have a similar effective period.

B. Pollution control and handling and preparation equipment. Under the proposed bill, "qualified conservation property" includes equipment which directly results in the use of less energy or in the use of an alternate substance, and any equipment which is "part of, physically attached to, or directly associated with or functionally related to" the equipment. Under current law, the credit for alternative energy property is also available for pollution control equipment and for on-site handling and preparatory equipment used in connection with the alternative energy property. These types of equipment should also be eligible for the new credit when they are used in connection with "qualified industrial energy property."

C. $55 per B.O.E. ceiling. The credit for qualified industrial energy property is subject to a maximum of $55 per barrel of oil equiva-

lent saved by the property. However, this limit is conceptually appropriate only in the case of property which qualifies for the credit because it reduces the amount of energy used per unit of output. Property in the second category (property which enables an existing facility or process to use an alternate substance as a fuel or feedstock) should qualify for the credit even if it uses the same amount of energy as was previously used by the facility. Nevertheless, such property would not be eligible for the credit if the bill is not revised so that the $55 per B.O.E. limit does not apply to property in the second category. This would completely frustrate the policy behind adding the second category of energy property to the bill. Accordingly, the $55 per B.O.E. limit on the credit should only apply to equipment which is eligible for the credit by reason of proposed Section 44F (c)(1)(B)(i).

In the case of qualified industrial energy property, the $55 per B.O.E. limit may well be conceptually appropriate. However, this maximum figure should be adjusted periodically to offset the effect of inflation on the cost of energy and energy related investments. Otherwise, even though the credits provided by S. 3006 will in some cases be available through 1994, the fixed $55 per B.O.E. limit will render the credit meaningless for capital-intensive energy conserving projects long before that date.

D. Affirmative commitments extension. Under current law, alternative energy property is eligible for a 10 percent energy tax credit through the end of 1982, with an extension through 1990 for certain long-

term projects to which the taxpayer is affirmatively committed by the end of 1982. S. 3006 would extend the effective date of the credit for specially defined energy property and for most types of alternative energy property through the end of 1986, and would increase the amount of the credit to 20 percent. However, in drafting the bill, no provision was made to extend the credit for these categories of equipment beyond 1986 in the case of long term projects to which the taxpayer is affirmatively committed by the end of 1986. Moreover, as drafted, the bill would actually eliminate the extension through 1990 which is available for alternative energy property and specially defined energy property under current law. Under S. 3006, the proposed credit for qualified industrial energy property would be available through 1994 for long term projects under terms similar to those provided under current law. A similar affirmative commitments extension should be provided for alternative energy property and specially defined energy property as well.

AISI appreciates the opportunity to submit these comments, and urges the Senate Committee on Finance to accept our recommendations as consistent with the development of a comprehensive and meaningful industrial energy policy for the United States.

Sincerely,

Robert B. Pamplin

WISCONSIN
Solid Waste Recycling Authority

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Arloe W. Paul • Chairman
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Warren K. Porter • Executive Director

October 16, 1980

Mr. Michael Stern,
Staff Director
Senate Committee on Finance
Room 2227
Dirksen Senate Office Building
Washington, D. C. 20510

RE: SENATE BILL 3006 - INDUSTRIAL ENERGY EFFICIENCY AND FUEL CONVERSION TAX INCENTIVE ACT OF 1980

Dear Mr. Stern:

A very serious problem facing many communities in Wisconsin is their inability to develop new sanitary landfills to accommodate the tremendous amounts of municipal, commercial and industrial solid waste being generated in their areas. Much of the land in Wisconsin is not suited for this purpose even though it is excellent for raising agricultural products. Because it is so well qualified for agriculture, it should not be converted to a landfill even if it could be constructed in such a manner as to be completely acceptable and successful. Over 8,000,000 tons of solid waste are produced in Wisconsin each year. With the compaction obtained in the better landfills, this is equal to a volume of fifteen square miles to a depth of one foot, every year.

The Wisconsin Solid Waste Recycling Authority was created by the State Legislature to recycle these wastes, by regions, into useful products such as paper, ferrous metal, aluminum, non-ferrous metal, glass and refuse-derived fuel (RDF). We are presently developing three regions. In the first region, we plan to recycle the solid waste by using the refuse-derived fuel in a dedicated boiler to produce steam for sale to an expanding paper mill, with the side effect that they will discontinue use of a gas/oil fired boiler. The volume of steam produced per day will be the equivalent of that which approximately 1,600 barrels of oil would generate.

We have state authorization to issue $75 million in revenue bonds to finance this project. However, our experience indicates it is becoming increasingly more difficult to market this type of bond because of the potential risks involved in such a financing. It would be extremely helpful in the sale of our bonds if the energy tax credits for tax exempt bonds could be increased from the present 5% to 10% and for non-tax exempt financing from 10% to 20%. The advantages gained by increasing these tax credits would eventually accrue to the communities being served by these facilities in the form of reduced tipping (or dumping) fees covering the solid waste.

We are of the opinion that Senator Wallop's Senate Bill S. 3006 would be of tremendous help to us in accomplishing the recycling of the solid waste in Wisconsin and nationwide, and thus provide a very meaningful alternative source of energy which, at present, is being shamefully wasted.

Your cooperation and support of this legislation will be greatly appreciated. Thanks for your efforts.

Sincerely,

Arloe W. Paul
Chairman

WHY INCREASE ENERGY TAX CREDIT FOR WASTE TO ENERGY

- Waste-to-energy is one of the two most significant short term contributors to the nation's synfuel goal.
- Tax credits are the most rapid and effective means to offset high risks and huge capital requirements of synfuel projects.
- Waste to energy is at a competitive disadvantage with other synfuels under Windfall Profits Tax Act.
- Investor resistance is overcome at a 20% energy tax credit.
- During construction of waste to energy plants a 20% energy tax credit will cause no loss in revenue to the Federal Treasury and over the life time of the plant can result in a substantial gain.

-Tax credits can reduce financing costs and lower local disposal fees.

ENERGY POTENTIAL

The conclusion of a 2/25/80 brief by the Congressional Research Service, "Synthetic Fuels Corporation and Technology" (#MB79245); "Of the many synfuels technologies, gasohol and 'energy from wastes' systems are likely to make the largest contributions to U.S. energy supply in the near term (before 1984)."

Under optimal conditions, it is estimated[1] that waste to energy has the capability of generating up to 75,000 barrels of oil equivalent (B.O.E.) by 1985 and another 150,000 B.O.E. by 1990. That would leave another 275,000 B.O.E. untapped in the nation's refuse. These capabilities go far to meeting the overall synfuel goal of 500,000 B.O.E. by 1987 and 2,000,000 B.O.E. by 1992, adopted by the Conference Committee for S-932.

Large urban plants can provide a significant amount of alternate energy where it is most needed--in cities with few other new energy options--and well distributed across the nation. Wastes of about a million residents can generate the equivalent of 4000 barrels of oil a day; areas of 250,000 residents can generate 700 B.O.E.,

making waste to energy feasible in over 250 urban areas.[2] Such plants also will not likely pose the magnitude of siting and environmental difficulties which are expected for more exotic synfuel technology.

Furthermore, no waste to energy systems are built without a specifically identified energy user, thus the energy produced supplies a well defined energy need.

WHY CHOOSE TAX CREDITS?

An Advisory Panel on Synthetic Fuels to the House Committee on Science and Technology (2/14/80) found that "neither the proposed Synthetic Fuels Corporation or current tax law will provide the economic incentives necessary to stimulate large scale synfuels production." Its primary recommendation was an expansion and extension of the special energy investment tax credit in order to offset the high risks and huge capital investments which commercialization of synfuels involve.

Tax credits are a proven means of attracting investors of the size and profitability who are the only source of the capital required.

Tax credits use traditional money market mechanisms. They are well understood by the financial community. They decentralize decision making. They require no new administrative bureaucracy with a life of its own. They can be of limited duration and can be eliminated when risk has been reduced.

Existing law enables an equity investor to deduct from taxes an amount equal to 20%* of the total project cost in the years that he has made "qualified progress expenditures" (with certain qualifications as defined in the IRC). In an assumed case, where private equity represents 25% of capital, on a $150 million project, the equity share would be $37.5 million and the 20% tax credit would be approximately $30 million.

* (10% standard investment tax credit + 10% energy tax credit)

The investor is exposed, however, to not only to the loss of $7.5 million, but to recapture of the entire credit plus interest if the project does not operate longer than 7.5 years. Risk of just that is substantial in a fledgling industry, which to-date has no commercial successes and which is facing possible loss of high energy revenues from conversion by utility customers from oil to coal. The magnitude of the risk is exemplified in a recent prospectus to finance a resource recovery project:

Construction risks	-	Cost overruns, unavailability of construction completion bonds, insolvency of contractor.
Fuel production	-	Inability to attain or maintain projected levels of production or sustained quality.
Operating hazards	-	Potential injury to persons or property which can result from operation of any large scale mechanical process.
Marketing risks	-	Declining continued sales of fuel product at profitable levels.
Supply risks	-	Lack of guarantees that refuse supply will be secured by market forces, or in future, not be attracted to competing facility.
Tax risks	-	Recapture of all tax benefits from both tax credits and depreciation deductions in the event of foreclosure or abandonment of the project.
Third party consents	-	Failure to achieve important third party contracts or licenses.
Government regulation	-	Regulatory delays, failure to obtain operating permits and/or adequate and timely disposal rate increases.

Moreover, a <u>means to stimulate equity capital is increasingly needed as debt capacity shrinks</u>. An Executive Vice President of Chase Manhattan recently warned a resource recovery conference:

> "The available pool of resources will probably not keep pace with the increasing level of municipal requirements and ... our willingness to commit those resources will have to be constrained by the debt capacity of the borrowers -- and, in particular cases, that will be a constraint of some significance ... The [changes in bond markets] will give us problems in allocating resources among our various customer segments."

<u>WHY A NEED TO INCREASE TAX CREDITS?</u>

The 10% energy tax credit (E.T.C.) for biomass properties provided by the <u>Windfall Profits Tax Act did not result in any increase for waste to energy systems</u>, since these were eligible already for a 10% E.T.C. as recycling equipment under the Energy Tax Act of 1978. The 1980 Act merely extended the credit for 3 years (and

extended the definition of eligible property to include certain property not before covered under the definition of recycling equipment).

In fact, waste to energy systems are penalized by the Windfall Profits Tax Act relative to other alternate energy sources. The Windfall Profits Tax Act either increased the E.T.C. to other energy technologies or gave supplementary tax advantages to those which received the 10% E.T.C. in this Act.

> For example, business solar investments, which typically will be less than $1 million (as compared to a typical $150 million waste to energy plant) were awarded a 15% E.T.C. This would attract an investor to spread his risk over 150 solar installations of $1 million each and enjoy a 15% E.T.C. rather than risk all $150 million on a single venture returning only a 10% E.T.C.

Other alternate energy technologies getting the 10% E.T.C. are qualified under the Act, to receive production tax credits up to $3 a B.O.E. and other advantages, such as exemption from the excise tax for gasohol.

> "Gasohol costs up to $80 a barrel when one takes the several subsidies into account," according to US EPA Assistant Administrator William Drayton.

In addition, 18 states give tax credits for solar and alternate energy projects other than resource recovery facilities. These distort the relative real economic positions of the various alternate energy sources and divert investment away from waste to energy. Offsetting these barriers suggest waste to energy should have a comparatively greater tax credit.

One New York investment firm has advised:

"We feel that a 20% E.T.C. for waste to energy would be an effective mechanism for reestablishing the desirable relative positions among new source possibilities and on an absolute basis would insure that investors will again look favorably on waste to energy as a desireable investment opportunity."

WHAT IS THE COST TO THE FEDERAL TREASURY?

None. Revenues increase if the project stimulated by the tax credit succeeds; if it fails, the credits are recaptured. The many projections of "lost revenues" to the Federal Treasury ignore the central fact that the Treasury will actually gain substantial corporate and personal income taxes and social security payments which would not have been generated without the tax credit.

For example, as a result of a 10% energy tax credit (plus 10% standard I.T.C.) on a $150 million resource recovery plant, at the same time during construction the government appears to be forfeiting an additional $15 million in revenues, it will actually be collecting an estimated $37.5 million in personal and corporate income taxes and social security payments from labor involved directly and indirectly in construction. In addition, taxes payable (average 5%) on corporate profits on a $150 million project would be $7.5 million. Thus, during construction, the Federal Treasury earns a profit of $45 million on, in effect, no investment and solves a social problem, disposing of refuse, which would otherwise be more costly to some level of government. Increasing the energy tax credit portion to 15%, the Treasury would net $7.5 million. Even at a 20% energy tax credit, the Federal Treasury forfeits no revenues, ($45 million total credit; $45 million increased on individual and corporate taxes) and would stimulate $150 million investment of private funds in energy development.

Moreover, once in operation, the Treasury would collect annually $600,000 in direct project individual income taxes (not including taxes from increased earnings of stockholders, spin off recycling industries, lower energy costs, etc.) totalling over the 25 year life of the project, $15,230000 at current dollars and tax rates. Over the 25 year life of the project, corporate taxes at 50% of total earnings of $300 million would be $150 million.

Therefore, for, in effect, a no cost subsidy (even if energy tax credit were 20%) the total "profit" to the government would be over $165 million (in 1980 dollars).

WILL A HIGHER ENERGY TAX CREDIT REDUCE LOCAL TAXES?

To the extent that disposal of solid wastes is a significant and rapidly escalating portion of the cost of local government, local taxes can be held down through adoption of an increased energy tax credit for waste to energy systems. Typically, a large urban waste system will be financed by a combination of equity and tax free bonding. The cost of equity financing depends upon the risk and possible return on each project. The availability of increased energy tax credits over the life of the project should reduce the risk and therefore the cost. This in turn should be directly transferable to reducing the tipping fee. In the case of the earlier example such a reduction could amount to as much as $10 million less in tipping fees over the life of the project.

Footnotes:

1) Estimate, Blythe Eastman Paine Webber. Source: Robert Aldrich

2) National Center for Resource Recovery Bulletin
Fall, 1978

Assumptions:
(rounded to the nearest hundred thousand)

Energy Potential

500,000 tons - National resource recovery potential by 1990[1]

1.4 barrels of oil equivalent/ton of refuse[2]

50,000 tons disposal capacity in work by 1985[3]

100,000 tons disposal capacity in work by 1990[3]

Costs

Capital cost/ton refuse processed = $50,000 (1979)[3]

Proposed sale of plant[4]:

$150 MM	-	3000 T/D plant
37.5 MM	-	equity capital
37.5 MM	-	senior debt
75.0 MM	-	subordinate debt

Tax Estimates

Operating Period[5]:

Assume 25 year life
120 plant employees @ $17,000 taxed at 23%
10 associated professionals @ $35,000 taxed at 40%

F.I.T./S.S.	= $ 600,000 annually
25 years x 600,000	= 15,000,000
Corporate profit before taxes, years 10-25	300,000,000
F.I.T./S.S.	150,000,000

Total taxes paid by project = $165,000,000

Footnotes:
1) Reasonably retrievable waste based on SMSA's National Center for Resource Recovery Bulletin, Fall 1978.
2) 8.0 MM Btu's/ton of municipal waste, DOE, ERA, Docket No. ERA-R-79-28 (if 6.0 MM Btu's/barrel of oil, then 1 ton municipal waste=1.4 barrels of oil)
3) Estimate, Blythe, Eastman, Paine Webber. Source: Robert Aldrich.
4) Financing model, Combustion Equipment Associates, Inc.
5) Best cost estimates, available using current engineering standards and operating experience, Combustion Equipment Associates, Inc.

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The Honorable Russell Long
Chairman, Committee on Finance
United States Senate
Washington, D. C. 20510

Dear Mr. Chairman:

This letter is submitted by the International Cogeneration Society for inclusion in the Committee's record of the hearings on S. 3006, the Industrial Energy Efficiency and Fuel Conservation Tax Incentive Act of 1980. A copy of this letter is being sent to each member of the Committee.

The International Cogeneration Society (ICS) is a non-profit organization composed of representatives of private industry, public utilities, and state and federal governments. ICS was formed to act as a source of education and information about cogeneration, and to represent the interests of cogenerators and potential cogenerators.

SUMMARY

Cogeneration is one of the most promising techniques for energy conservation that is currently available to industries in the United States. It is important that, as this Committee again begins to consider legislation to pro-

vide tax incentives for energy conservation, careful consideration be given to the need for tax incentives for cogeneration. Unfortunately, while S. 3006 generally represents an important and highly commendable step toward the development of meaningful incentives for energy conservation, it would not provide incentives for many cogeneration projects. Indeed, in some instances, cogeneration will actually be discouraged if S. 3006 is enacted. ICS believes that this is contrary to sound energy policy, and that S. 3006 should be revised to include a special rule extending the increased energy tax credit to all cogeneration equipment.

TECHNICAL ASPECTS OF COGENERATION

Cogeneration is the sequential generation of electric (or mechanical shaft) power and useful energy--generally in the form of space heat or industrial process heat--from the same energy source. In the United States today, electric energy and heat for space heating or industrial process uses are generally produced separately. Cogeneration, by combining these two functions into a single integrated energy-using system, can lead to the realization of substantial energy savings. Cogeneration systems can achieve overall efficiencies of energy use as high as 80 percent, which compares very favorably with the 36 percent efficiency which is typical for central station power plants. Cogeneration can result

in total energy savings of up to 35 percent over separate, single-purpose systems producing the same quantities of electricity and usable heat.[1/] Government studies have estimated that the widespread practice of cogeneration could result in energy savings of as much as 2.4 million barrels of oil a day by 1985.[2/] Indeed, the potential savings from cogeneration are so substantial that Robert Stobaugh and Daniel Yergin, in their widely-read book Energy Future, Report of the Energy Project at the Harvard Business School, characterized cogeneration as "Industry's North Slope."

Cogeneration can be practiced in connection with a variety of energy-using systems. In the simplest case, high-temperature, high-pressure steam is produced in a boiler. The steam is used to generate electricity in a back-pressure or extraction turbine, after which the lower pressure and lower-temperature exhaust steam is used for industrial process or space heating purposes. In the alternative, electricity may be generated using a diesel engine or a com-

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1/ Comptroller General's Report to the Congress - Industrial Cogeneration -- What It Is, How It Works, Its Potential, U.S. General Accounting Office, April 1980, pp. 90-91.

2/ A number of recent studies are summarized in Cogeneration: Technical Concepts, Trends, Prospects, U.S. Department of Energy, September 1978, p. 38.

bustion turbine, after which the exhaust is channeled to a waste heat recovery boiler to produce steam for other purposes. In simpler systems, the steam from the waste heat boiler is used directly for space heating or industrial process purposes. However, in combined-cycle cogeneration systems, the steam from the waste heat recovery boiler is first used for further electric generation, and is passed through an extraction or backpressure turbine before it is made available for space heating or process use. In each case, energy is used more efficiently in the cogeneration system than it would be in a single-purpose energy system.

A significant characteristic of cogeneration systems is that they operate at optimal efficiency (and thus achieve the greatest energy savings) at specific ratios of electric power production to steam production. The optimal ratio varies, depending on the type of system involved. The power-to-steam ratio for cogeneration systems utilizing backpressure steam turbines is 30 to 70 kilowatt hours (kwh) per million BTUs of steam. For combustion turbine cogeneration systems, the power-to-steam ratio is 125 to 220 kwh per million BTUs; and for combined-cycle combustion turbine systems, the power-to-steam ratio is 200 to 320 kwh per million BTUs. Thus, in order to realize the maximum possible energy savings from cogeneration, certain minimum amounts of electricity must be

produced by the cogeneration system.

Because both useful heat and electric energy are produced by cogeneration systems, such systems inevitably use more energy than would be used by a single-purpose system solely to produce a comparable amount of useful heat. The amount of extra energy used by a cogeneration system to generate electricity is the "incremental heat rate" for the system. For example, the incremental heat rate for steam turbine cogeneration systems is 4,500 to 6,000 BTUs per kwh. Accordingly, when such a system is achieving optimal levels of electricity and heat production, it can require as much as 42 percent more energy than would be needed by a single-purpose system to produce the same amount of useful heat but no electricity. The incremental heat rate for combustion turbine cogeneration systems is 5,500 to 6,500 BTUs per kwh, and such systems may require as much as 143 percent more energy than a single-purpose system producing comparable levels of useful heat. In the case of combined-cycle combustion turbine systems, the incremental heat rate is 5,000 to 6,000 BTUs per kwh,[3/] and as much as 192 percent more energy may be required to produce the same amount of usable heat as would be produced

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3/ These incremental heat rate figures dramatically demonstrate the potential energy savings from cogeneration, since they are much lower than the amount of energy used in a single-purpose electric-generating facility. Electric utilities use, on the average, 10,000 BTUs of heat to generate one kwh of electricity in a central station power plant using high efficiency condensing turbines.

by a single-purpose, heat-producing system.[1/] Thus, while cogeneration increases the overall efficiency of energy use, it can also substantially increase the on-site energy consumption of the typical industrial energy consumer over the amount of energy that would be required to satisfy its process heat needs alone. In effect, some of the energy that would otherwise be used to generate electricity off-site in a central power plant is instead used to generate electricity at the site of the industrial facility.

IMPACT OF S. 3006 ON COGENERATION

S. 3006 would provide a 20 percent non-refundable energy tax credit (in addition to the regular 10 percent investment tax credit) through the end of 1986 for certain items of energy property. The credit would be available for property which is currently included in the category of alternative energy property under Section 48 (l) (3) (A) of the Internal Revenue Code (other than geothermal and ocean thermal property), or in the category of specially defined energy property under Section 48 (l) (5) of the Code. In addition, the credit would be available for a new category of energy property--"qualified industrial energy property."

1/ All figures are derived from the Comptroller General's Report, supra.

Qualified industrial energy property is generally property which modifies or replaces equipment used in an existing manufacturing, production or extraction facility; which does not increase the amount of oil or gas used per unit of output, and which either results in the use of less energy per unit of output or permits the use of an energy source other than oil or gas. Eligible equipment must be an integral part of the manufacturing, production or extraction process. The new credit for conservation property would not be available if the credit would be less than eleven dollars per barrel of oil saved during a representative one-year period, and would be subject to a maximum of 55 dollars per barrel of oil saved during that period.

Because the definition of qualified industrial energy property is linked to the amount of energy used at an industrial facility, rather than the efficiency of energy use, many industrial cogeneration systems would not qualify for the increased credit. As indicated above, while the instal-lation of industrial cogeneration systems can lead to substantial overall increases in the efficiency of energy use, it can also increase the amount of energy actually consumed at the site of an industrial facility. Thus, many industrial facilities which install cogeneration equipment would not be eligible for the increased energy tax credit for qualified industrial energy property provided under S. 3006 because the energy consumed by the facility would increase, and not decrease. In some cases, S. 3006 could even have the

effect of discouraging industrial cogeneration, since facilities which could be modified to include cogeneration equipment may instead be modified to include single purpose energy using equipment in order to qualify for the increased credit.

Another aspect of S. 3006 which could limit the extent to which certain cogeneration systems would be eligible for an energy tax credit as qualified industrial energy property is the requirement that the equipment be "an integral part" of manufacturing, production, or extraction. The term "integral part" is used in the Statute and the regulations for the existing investment tax credit. Reg. § 1.48-1 (a) (4) provides that property is an integral part of an activity if it is used directly in the activity and is essential to the completeness of the activity. The IRS' interpretation of this term strongly suggests that electric generating equipment which is part of an industrial cogeneration system would not be considered to be an integral part of a manufacturing, production or extraction facility. In a recent private ruling (Letter Ruling No. 8005017), the IRS ruled that a hydroelectric dam owned by a cotton manufacturer and used to provide electricity for the manufacturer's cotton mill was not eligible for the regular investment tax credit because it

was not an integral part of the cotton manufacturing process. The IRS concluded that the dam was not essential to the completeness of the taxpayer's mill operation since electric power had in the past been purchased from a local utility and could be purchased from a utility in the future. If this reasoning is applied to industrial cogeneration systems, electric generating equipment installed at an industrial facility and used to produce electricity for use by the facility or for sale to a utility would not be considered to be an integral part of the manufacturing process. Accordingly, the "integral part" requirement could prevent any cogeneration equipment which would otherwise be eligible for a credit under S. 3006 from actually benefiting from that credit.

RECOMMENDATION

In general, S. 3006 is a well conceived proposal. However, the fact that S. 3006 does not provide incentives for cogeneration, and will in some instances actually discourage cogeneration, is contrary both to sound energy policy and to the substantial federal commitment to encourage cogeneration. It is contrary to sound energy policy because it provides no incentive for the most efficient overall form of energy use and encourages industrial energy consumers to continue to use less efficient single-purpose energy systems. It is contrary to existing federal energy policy because it

is inconsistent with the numerous federal programs designed to encourage cogeneration, including the Public Utility Regulatory Policies Act and the Fuel Use Act.

In recognition of the substantial contribution that cogeneration can make to resolving our energy crisis, and in order to be consistent with other elements of our national energy program, any new energy tax credit legislation should provide equal tax incentives for cogeneration equipment. ICS recommends that cogeneration equipment be included as a separate category of qualifying property that is eligible for the increased energy tax credit proposed in S. 3006. ICS further recommends that the "integral part" requirement be deleted entirely or at least made inapplicable to cogeneration equipment. Finally, ICS recommends that S. 3006 contain a new definition of cogeneration equipment, and that it not incorporate the definition of cogeneration equipment which was added by the Windfall Profit Tax Act. The definition added by the Windfall Profit Tax Act suffers from several significant drawbacks. It does not include mechanical cogeneration systems, and it does not include oil or gas fired cogeneration systems--regardless of whether they have received an exemption under the Fuel Use Act. In addition, the current definition does not extend the credit to the entire cost of a cogeneration system, even though the addition of cogeneration equipment increases the cost of many portions of an energy

using system in addition to those portions used to produce the "secondary energy product" of the system. For purposes of S. 3006, cogeneration equipment should be defined as any equipment which is part of an energy using system which produces electrical or mechanical energy, as well as another form of useful energy, through the sequential use of energy.

ICS appreciates the opportunity to submit these comments, and looks forward to working with the Finance Committee in the future to help develop a comprehensive and meaningful cogeneration policy for the United States.

Respectfully submitted,

Lee M. Goodwin

Lee M. Goodwin, Chairman
ICS Legislative and Regulatory
Affairs Committee

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