



Telephone: (212) 867-0052

**Petroleum Industry Research Foundation, Inc.**

**122 EAST 42<sup>nd</sup> STREET**

**New York, N. Y. 10017**

U.S. OIL SUPPLY AND DEMAND

TO 1990

October, 1977

## TABLE OF CONTENTS

	<u>Page</u>
I. Summary of Findings	1
II. Assumptions	3
III. Our Demand Forecast and The National Energy Plan	5
IV. Petroleum Product Imports	6
V. Markets For Major Products	9
VI. Oil Demand by Major Consuming Sectors	13
VII. Domestic Oil Supplies	13
TABLES	
I. U.S. Energy Supply/Demand, 1965-1990	15
II. U.S. Energy Demand, Average Annual Growth Rates By Sector, 1965-1990	16
III. U.S. Petroleum Products Demand, 1965-1990	17
IV. U.S. Petroleum Supply And Demand, 1976-1990	18
V. U.S. Energy Consumption For Electric Power Generation, By Fuel, 1973-1990	19
VI. Oil Demand By Consuming Sector, 1973-1990	20
VII. U.S. Petroleum Supply, 1973-1990	21

This study is an attempt to project U.S. oil supply and demand within the framework of total U.S. energy requirements over the 14-year period 1976-1990. We have based our study on an optimistically oriented assumption of oil and total energy conservation achievable during this period and a slower general economic growth rate than is projected in some other studies. Thus, our findings should not be viewed as a "base" case or a "most likely" case but as close to the minimum amount of oil likely to be required under reasonable conditions.

#### I. Summary of Findings

The principal findings of our study are:

(1) The exceptional increases in real foreign oil prices in 1973/74 and the subsequent increases in all U.S. energy costs, together with a variety of government policies designed to curb energy demand and encourage the substitution of oil by other energy sources, will result in a substantially lower growth in total energy and oil demand than in the most recent "normal" historic period (1965-73). But within our time frame the growth in energy demand will not level off, nor will that of oil demand.

(2) The growth rate in energy demand will decline throughout the period: from 2.7% in the 1976-80 period to 2.4 and 2.1% in the 1980-85 and 1985-90 periods respectively. The latter will be about half the historic growth rate. The amount of energy required per unit of GNP will also decline significantly below the historic ratio.

This study is an attempt to project U.S. oil supply and demand within the framework of total U.S. energy requirements over the 14-year period 1976-1990. We have based our study on an optimistically oriented assumption of oil and total energy conservation achievable during this period and a slower general economic growth rate than is projected in some other studies. Thus, our findings should not be viewed as a "base" case or a "most likely" case but as close to the minimum amount of oil likely to be required under reasonable conditions.

#### I. Summary of Findings

The principal findings of our study are:

(1) The exceptional increases in real foreign oil prices in 1973/74 and the subsequent increases in all U.S. energy costs, together with a variety of government policies designed to curb energy demand and encourage the substitution of oil by other energy sources, will result in a substantially lower growth in total energy and oil demand than in the most recent "normal" historic period (1965-73). But within our time frame the growth in energy demand will not level off, nor will that of oil demand.

(2) The growth rate in energy demand will decline throughout the period: from 2.7% in the 1976-80 period to 2.4 and 2.1% in the 1980-85 and 1985-90 periods respectively. The latter will be about half the historic growth rate. The amount of energy required per unit of GNP will also decline significantly below the historic ratio.

(3) All sectors in the energy market will reflect the lower growth rate in total energy. The sharpest decline will be in the transportation sector which will drop from a historic growth rate of over 5% to approximately 1% over the next 14 years. This will be due largely to more efficient use of fuel by automobiles.

(4) Among energy sources other than oil, gas supply and demand will continue to decline until at least 1980 after which it will increase at a very modest rate, primarily due to rising imports. Coal supply and demand will rise at more than three times the historic growth rate. Coal's limitations will be on the demand rather than the supply side; that is, the U.S. energy market will not be able to absorb all the coal that could be produced. Nuclear power will show the fastest growth rate of any energy source, contributing more than 11% to total U.S. energy supply by 1990, compared to less than 3% in 1976.

(5) Oil demand will continue its historic pattern of rising more rapidly than total energy until about 1980. After that it will move at a substantially lower rate. By the late 1980's its rise will be only about 0.5% per year, or about one-tenth of its annual historic growth rate.

(6) Domestic oil supplies will not be able to keep up even with this very diminished demand growth so that oil imports will have to rise throughout the period. By 1990 they will amount to over 10 million b/d, about 38% above last year's level. The share of oil imports in our total energy balance will remain approximately unchanged. But since

gas imports will rise faster than energy demand, the share of total energy demand supplied from foreign sources will rise slightly, from 22.5% in 1976 to 24% in 1990.

(7) The demand for all oil products will grow substantially below the historic rate for the period as a whole. The fastest growth rate will be experienced by petrochemical feedstocks (the principal component of the category "Other" in Table III), reflecting continued rapid growth in the demand for petrochemical products. By contrast, gasoline, after a modest increase to about 1980, will show a decline throughout the 1980's. By 1990 gasoline demand will be about even with last year's. Distillate fuel oil will grow somewhat faster than total oil demand, largely because of increased requirements from the industrial sector. Residual fuel oil demand will grow rapidly over the next 4-5 years but will then level off and start declining from around the mid-1980's on, because of increasing competition from coal in the utility and industrial market and from nuclear power in the utility market. However, by 1990 it will still be substantially above last year's demand level. On balance, the share of total oil supplies used for industrial purposes will increase between now and 1990 while the share going into the residential and transportation markets will decline somewhat.

## II. Assumptions

Our forecast is based on the following major assumptions:

(1) The U.S. real GNP will grow near the historic rate of 4%/year from 1976 to 1980 but will decline significantly -- to 3.2% -- thereafter. For the entire 14-year period, we have projected that each percentage

change in GNP will be accompanied by a change of about 0.71% in energy demand. In the historic period (1965-73), the change was 1.10% (see Table II).

It should be pointed out that because of the close relationship between energy and real GNP any change in the GNP growth rate from our assumptions would have a corresponding effect on energy demand growth. Since the "swing" fuel in our energy balance is imported oil, the impact of a change in the GNP growth rate would fall primarily on the required volume of oil imports. Thus, a relatively small increase in GNP growth from our assumption could bring about a disproportionately large increase in oil imports.

(2) Foreign crude oil prices will remain approximately stable in real (constant) terms throughout the period and the delivered cost of foreign gas will be about equal with that of foreign oil on a Btu basis. Domestic crude oil prices paid by refiners will rise to foreign levels by 1980. Wellhead prices for oil currently under control will continue to remain under some form of control throughout the entire period, with the exception of production from stripper wells, enhanced recovery, shale oil and newly discovered oil. Prices for new domestic gas supplies will also be on a parity with oil prices by 1980. Prices for old gas will continue to be controlled. As a result, the average price of gas in the U.S. will rise in real terms throughout the period but will remain below the equivalent cost of oil. Coal prices to end users will increase somewhat in real terms but will remain below the cost of oil.

Our assumption of steady real world oil prices is a working hypothesis and does not represent the most likely case. We believe that between the possibilities of a decline and an increase in real prices, the increase is more likely, particularly in the period from 1985 on, given OPEC's continuing power in setting prices and the growing demand for world oil throughout the period. However, in view of oil's relatively low price elasticity of demand and the very limited short-term ability to substitute other energy sources for oil in addition to that built into our forecast, the real price increase would have to be substantial to have a significant effect on U.S. oil demand.

(3) We assume that in addition to energy conservation related to price increases there will be some further conservation as a result of governmental mandates or incentives. The same will apply to the substitution of oil and gas by coal as a boiler fuel in industrial and power plants.

### III. Our Demand Forecast and The National Energy Plan

Our forecast agrees directionally with the Administration's National Energy Plan (NEP), issued last April. We see energy demand growth slowing down significantly from about 1978-79 on and a switch from oil to other energy sources, such as coal. However, for economic, political and technical reasons we see these trends developing much more slowly and gradually than the NEP does. Hence, we project both oil demand and import requirements in 1985 about 3 million b/d higher than the NEP.



We also do not agree with the NEP's energy/GNP growth rate ratio. Again, directionally we concur with the NEP's projection of a decline in that ratio from the historic level of over 1.0. However, we do not believe it can be reduced to an average of about 0.5 over the next eight years. We recognize the Administration's dilemma: it has opted for a high GNP growth rate for the purpose of social improvements, such as unemployment reduction, while at the same time trying to strike a reasonable balance between energy demand and available domestic supply. But high GNP growth will inevitably increase oil imports above the NEP's target and probably even above our projection, particularly since a growing share of oil will be used for industrial purposes in the future (see Table VI). Yet a retrenchment from the announced expansionist economic policy for the purpose of reducing the growth in oil imports may be considered undesirable for other reasons.

Nevertheless we believe our projected GNP growth rate for the 1980's to be realistic. It is fractionally higher than that of the latest 10-year period (1966-76). Like that period, it will probably consist of planned higher growth rates, occasionally interrupted by unplanned periods of stagnation or decline.

#### IV. Petroleum Product Imports

The distribution between crude oil and products in future imports will depend primarily on the state of U.S. refining capacity and the ability of domestic refiners to compete with foreign products. In 1976 products imports amounted to 2 million b/d, or 27% of total oil imports; refining capacity averaged 15.7 million b/d and the utilization rate was 85.4%. By 1980 refining capacity will have risen to 17.3 million b/d.

Assuming a maximum sustainable average utilization rate (91% of crude capacity), products imports will have to rise to 2.6 million b/d to meet our projected demand. Most of the increase in imports will come in the form of residual fuel oil (+350,000 b/d), mainly to the East Coast, and natural gas liquids (about +200,000 b/d), mainly to the Gulf Coast. Imports of gasoline, heating oil, diesel oil and jet fuel would not increase substantially from last year's level, under our assumption of refinery utilization.

Whether this assumption is correct depends to a large extent on U.S. government policy. If refiner entitlements are phased out by 1980 so that the price of domestic crudes will be set by the landed cost of foreign crudes, actual crude costs to U.S. refiners (ex-duty) would be somewhat higher than to Caribbean and European export refiners because the latter can bring Persian Gulf crude in VLCC's (super tankers) directly to their offloading terminals, while U.S. refiners must use transshipment facilities or lighter the VLCC's offshore. Other advantages of foreign over U.S. refiners will be (1) continued substantial under-utilization of foreign capacity until the early 1980's at least, which will make incremental runs much more attractive to foreign refiners than to their U.S. counterparts; (2) continued depressed world tanker rates, while U.S. tanker rates (for product shipments from the Gulf Coast to the East Coast) will remain high and (3) lower foreign operating costs and income tax liability. Under these conditions, the existing 42¢/bbl net import fee protection for domestically refined products may

be insufficient to prevent an increase in the importation of light products, primarily from Caribbean refineries which have an advantage over European refineries at the U.S. East Coast. It is unclear, as of now, whether such a development would cause the government to increase its protection of domestic refineries.

Some of the cost advantages of foreign refineries may decline in the early 1980's for these reasons: (1) there is likely to be at least one Gulf Coast superport permitting direct offloading of VLCC's; (2) products pipeline capacity from the Gulf Coast to the East Coast will probably be expanded; and (3) the capacity utilization of foreign refineries will increase (more so in the Caribbean than in Europe).

Table IV shows how much domestic refining capacity would be required by 1985 and 1990 under our demand assumptions if product imports are to be kept at the projected 1980 level of 2.6 million b/d. The increase in capacity would be 210,000 b/d annually to 1985 and 130,000 b/d annually thereafter to 1990. This would be substantially less than the long term historic rate of 350,000-400,000 b/d of annual capacity additions.

Whether the required capacity will actually be built may depend more on future government policy than oil demand, for the reasons mentioned above. If it is built and products imports remain more or less unchanged between 1980 and 1990 there would still be a significant change in their compositions. Residual fuel oil imports can be expected to decline from the early 1980's on, in line with the general decline in the demand for this product and a domestic refinery yield likely to be maintained at 11.5-12.0% of crude runs. Natural gas liquids imports,

by contrast, will rise substantially in the 1980's and may be 3-4 times as high in 1990 than last year's volume of 130,000 b/d.

V. Products Markets

a) Gasoline

Our projection for declining gasoline demand from 1980/81 on is based entirely on more efficient gasoline utilization in new cars from 1978 on, as mandated by existing legislation, and a growing switch from gasoline to diesel engines beginning in the early 1980's because of the latter's much higher fuel efficiency. The total number of automobiles in use will increase throughout the period at slightly declining growth rates, as will their utilization (the average number of miles per car). The table below summarizes these developments.

	<u>1975</u>	<u>1980</u>	<u>1985</u>		<u>1990</u>	
			<u>Gasoline</u>	<u>Diesel</u>	<u>Gasoline</u>	<u>Diesel</u>
Cars in Use (millions)	95	110	123	2	130	9
Average miles per car	10,700	11,200	11,775		12,250	
Average miles per gallon	14.0	15.0	19.2	30.0	22.8	32

b) Distillates

Residential/commercial demand for distillate heating oil, which last year accounted for 47% of total distillate fuel oil consumption, will increase at a very modest rate (less than 2% annually) to about 1980, then stabilize to the mid-1980's, after which a very modest decline might set in. These developments are due largely to anticipated

improvements in the insulation of residential structures. For example, since 1973 some 3 to 5% of existing structures have been retrofitted annually and this trend is expected to continue at possibly faster rates for at least the next five years. In addition from the mid-1980's on, distillate fuel oil use in the residential heating market will face increasing competition from both higher gas availability and solar heating.

Electricity will continue to be the heating fuel in about one-half of all new homes on a nationwide basis, as it has in the last three years, and in at least one-third of new homes in the regions where oil heat has its principal markets. Natural gas will not be in short supply in the residential market even over the next 4-5 years when supplies will continue to decline. Beyond that time the phasing out of gas as a boiler fuel in electric utilities and a substantial number of industrial plants, together with a reversal in the decline of gas supplies because of rising imports and some expansion in synthetic gas production, will enable gas utilities once again to expand their share in the residential market.

In contrast to developments in the residential market, distillate fuel oil demand in the industrial market will rise rapidly over the next 4-5 years because of declining natural gas supplies. But, here, too, the increase in gas supplies from the early 1980's on, together with a growing use of electric power by industry, will cause a leveling off of distillate demand at that time. Thus, the growth in

distillate demand from 1985 to 1990 will come primarily from its use as an automotive passenger car fuel which could rise from 50,000 b/d in 1985 to 200,000 b/d in 1990. Additionally, some increase can also be expected in the 1980's from electric utilities, principally as a turbine fuel for power generation.

c) Jet Fuel

Jet fuel demand will grow at nearly twice the rate of total petroleum products but at only about 40% of its historic growth rate over the next 14 years. The reason for the faster growth than other products is that there is no oil or non-oil substitute for it so that the entire expansion in U.S. aviation over the next 14 years will have to depend on jet fuel. The reason for the slow-down from the historic growth rate is the maturation of jet plane travel after its spectacular growth in the 1960's, the airline industry's endeavor to conserve fuel through better plane capacity utilization and other measures and the relatively higher fuel efficiency of new airplane engines.

d) Residual Fuel Oil

This product is projected to register a very rapid growth rate over the next 3-4 years, then level off for several years and start declining from the mid-1980's on. More than half of the near term increase will go into the electric utility market under our assumption that U.S. electric power generation will rise at an annual rate of 5.3% between 1976 and 1980 (see Table V). However, that rate should be considered conservative, since this year's growth will be 6.5 to 7%.

If the growth to 1980 turns out to be faster, the impact would fall principally on residual fuel oil and, to a much smaller extent, on distillate fuel oil for turbine use, since all other power generating fuels are assumed to be used at their available, useable or permissible capacity.

After 1980 electric utility demand for fuel oil will grow at a very slow rate to about 1985, then it will start declining. Throughout the entire period, gas for electric power generation will decline sharply while coal and nuclear power will increase rapidly (see Table IV). Again, if our projected growth rate for electric power generation of just below 5% between 1980-85 and 4% between 1985-90 should prove to be too low, oil demand by utilities would be higher than in our forecast.

Outside the utility sector, residual fuel oil demand will increase rapidly through 1980, largely as a result of increased use in the industrial sector in place of natural gas. In the 1980-90 period, demand in these uses is expected to remain relatively flat. In the residential/commercial sector residual fuel oil demand will grow at an annual rate of 2-3% to about 1980 but will register almost no growth thereafter, due to better heat insulation and increased competition from natural gas and electric heat in newly built high-rise structures.

Geographically, the only growth areas for residual fuel oil demand beyond 1980 will be the Southwest (PAD III) and the Midwest (PAD II). All other major areas are expected to register declines in this period.

e) Other Oil Products

As Table III shows, the most rapid growth of any oil product will be registered by the category "Other". This category consists largely of LPG and oil products used as petrochemical feedstock. The principal feedstocks are gasoil (a form of distillate fuel oil), naphtha (the raw material for gasoline) and natural gas liquids (mainly ethane, propane, and butanes). The declining availability of domestic NGL's has caused petrochemical producers to turn increasingly to heavier feedstocks such as naphtha and gasoil. The growth in the demand for these products, together with increasing LPG use predicated on expanded imports, accounts for most of the expected increase in demand for other oil products.

VI. Oil Demand by Major Consuming Sectors

Over the next 14 years a shift will take place in the share of oil going to the various major markets (see Table VI). The transportation and the residential/commercial sector will continue to remain the two principal outlets for oil but the share of both will decline from last year's combined level of nearly 72% of total oil sales to 66% in 1985 and 65% in 1990. The offsetting increases will be registered mainly in sales to the industrial sectors. As a result, oil demand in the 1980's will be somewhat more sensitive to fluctuations in U.S. industrial output than in the historical period to 1974.

VII. Domestic Oil Supplies

Our projection of domestic crude and NGL supplies is shown in Table VII. For 1985 our figure of 10.8 million b/d is approximately in line with the NEP's projection of 10.6 million b/d if its plan is adopted in full.



Our projection is based on the assumption that domestic onshore production outside Northern Alaska will steadily decline from the current level of 6.8 million b/d to about 4.0 million b/d by 1990, reflecting the depletion of reserves in known oil bearing areas. The decline may be more than offset by an increase in offshore production (including offshore Alaska) from the current level of 1.2 million b/d to 2.9 million b/d by 1990, under the somewhat optimistic assumption that our Outer Continental Shelf contains fairly significant oil deposits and that government policy will encourage their search and development. We estimate further that enhanced (tertiary) recovery methods applied to existing deposits may yield up to 1 million b/d by 1990 and that Alaskan North Slope crude production will increase from the current level of 700,000 b/d to 2.1 million b/d by 1990. In addition, we expect synthetic oil production, primarily from shale, to become commercially significant from the mid-1980's on. Altogether, this would increase domestic oil (including NGL) supplies from all sources from last year's 9.7 million b/d to 11.2 million b/d by 1990, an annual increase of 1% over the 14-year period. Since oil demand during this period is expected to increase by 1.6% annually, we see oil imports rising from last year's level of 7.3 million b/d to 10.1 million in 1990.

TABLE I

U.S. ENERGY SUPPLY/DEMAND, 1965-1990

10<sup>15</sup> BTU

	<u>1965</u>	<u>1973</u>	<u>1976</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>
Supplies:						
Natural Gas (1)	16.1	22.5	20.2	18.5	19.1	19.3
(of which Imports*)	(0.5)	(1.0)	(1.0)	(1.2)	(2.6)	(3.2)
Oil and Other Liquids (2)	23.2	34.9	34.9	40.5	42.4	43.6
(of which imports**)	(5.3)	(13.3)	(15.6)	(19.9)	(20.5)	(21.5)
Coal (3)	11.9	13.3	13.8	16.4	21.2	25.2
Nuclear	-	0.9	2.0	3.9	6.9	11.6
Other	2.1	3.0	3.0	3.1	3.3	3.4
Total Primary Energy Demand	<u>53.3</u>	<u>74.6</u>	<u>73.9</u>	<u>82.4</u>	<u>92.9</u>	<u>103.1</u>
*Gas Imports:						
Pipeline	0.5	1.0	1.0	0.8	1.3	1.4
LNG	-	-	-	0.4	1.3	1.8
**in million barrels daily	2.5	6.2	7.3	9.3	9.6	10.1

AVERAGE ANNUAL GROWTH RATES  
(% Per Year)

	<u>1965/73</u>	<u>1973/76</u>	<u>1976/80</u>	<u>1980/85</u>	<u>1985/90</u>	<u>1976/90</u>
Natural Gas	4.3	-3.5	-2.2	0.6	0.2	-0.3
Oil and Other Liquids	5.2	0.0	3.8	0.9	0.6	1.5
Coal	1.4	1.2	4.4	5.3	3.5	4.4
Nuclear	-	30.0	18.2	12.1	11.0	13.4
Other	4.6	0.0	0.8	1.3	0.6	0.9
Total Primary Energy Demand	<u>4.3</u>	<u>-0.3</u>	<u>2.8</u>	<u>2.4</u>	<u>2.1</u>	<u>2.4</u>

(1) Includes conventional domestic production and coal SNG production.

(2) Crude oil, NGL and shale oil production.

(3) Domestic coal consumption, excluding coal used for SNG.

TABLE II

U.S. ENERGY DEMAND, AVERAGE ANNUAL  
GROWTH RATES BY SECTOR, 1965-1990

(% Per Year)

	<u>1965/1973</u>	<u>1976/1980</u>	<u>1980/1985</u>	<u>1985/1990</u>	<u>1976/1990</u>
Real GNP (a)	3.9	4.0	3.2	3.2	3.4
<u>Sectors</u>					
Residential/Commercial	3.4	2.4	2.2	1.75	2.1
Industrial Fuel	2.1	2.05	1.85	1.7	1.9
Industrial Raw Material	10.8	6.7	5.6	4.8	5.7
Transportation	5.1	1.8	0.6	0.7	1.0
Net Energy	3.8	2.4	1.8	1.7	1.9
Primary Energy (b)	4.3	2.8	2.4	2.1	2.4
Ratio, (b)/(a)	1.10 R	0.70	0.75	0.66	0.71

Note: Electricity use has been distributed to each of the end-use sectors.

TABLE III

U.S. PETROLEUM PRODUCTS DEMAND, 1965-1990  
(Million Barrels Daily)

	<u>1965</u>	<u>1973</u>	<u>1976</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>
Gasolines (1)	4.71	6.72	7.02	7.48	7.24	7.00
Distillates (2)	2.13	3.09	3.13	3.55	3.89	4.13
Residual Fuel Oil	1.61	2.82	2.79	3.59	3.67	3.38
Jet Fuel	0.60	1.06	0.99	1.11	1.27	1.48
Other	<u>2.25</u>	<u>3.61</u>	<u>3.51</u>	<u>4.29</u>	<u>5.04</u>	<u>5.66</u>
Total	11.30	17.30	17.44	20.02	21.11	21.65

AVERAGE ANNUAL GROWTH RATE  
(% Per Year)

	<u>1965/73</u>	<u>1973/76</u>	<u>1976/80</u>	<u>1980/85</u>	<u>1985/90</u>	<u>1976/90</u>
Gasolines	4.5	1.5	1.6	-0.7	-0.7	0.0
Distillates	4.8	0.4	3.2	1.9	1.2	2.0
Residual Fuel Oil	7.3	-0.3	6.5	0.4	-1.7	1.4
Jet Fuel	7.4	-2.2	2.9	2.7	3.1	2.9
Other	<u>4.9</u>	<u>-0.7</u>	<u>5.1</u>	<u>3.3</u>	<u>2.4</u>	<u>3.5</u>
Total	5.2	0.3	3.5	1.1	0.5	1.6

(1) Includes aviation gasoline.

(2) Excludes petrochemical feedstock use of gasoil which is included in "Other".

U.S. PETROLEUM SUPPLY AND DEMAND, 1976-1990

(Million Barrels Per Day)

	<u>1976</u>	<u>1980</u>	<u>1985*</u>	<u>1990*</u>
Refining Capacity	15.7	17.3	18.4	19.0
Crude Runs	13.4	15.7	16.7	17.3
Utilization Rate (%)	85.4	91.0	91.0	91.0
<u>Domestic Production</u>				
Crude Oil	8.1	9.0	9.7	9.8
NGL	1.6	1.4	1.4	1.4
Processing Gain	<u>0.5</u>	<u>0.5</u>	<u>0.6</u>	<u>0.6</u>
	10.2	10.9	11.7	11.8
<u>Imports</u>				
Crude	5.3	6.7	7.0	7.5
Products	<u>2.0</u>	<u>2.6</u>	<u>2.6</u>	<u>2.6</u>
	7.3	9.3	9.6	10.1
Less Exports	0.2	0.2	0.2	0.2
Domestic Demand	17.4	20.0	21.1	21.7

\* Assuming no change from the 1980 level of products imports.

Note: Sum of parts may not equal total due to rounding.

U.S. ENERGY CONSUMPTION FOR ELECTRIC POWER  
GENERATION BY FUEL, 1973-1990

	<u>1973</u>	<u>1976</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>
Total Electric Output (BKHR)	1,856	2,036	2,500	3,180	3,870
Nuclear: Capacity (000 MW)	18	41	73	118	185
Output (BKHR)	83	191	370	650	1,085
Coal: Use (MM Tons/Yr)	388	448	560	765	970
Output (BKHR)	846	944	1,195	1,600	2,020
Natural Gas: Use (TCF/Yr)	3.6	3.1	2.1	1.5	0.5
Output (BKHR)	340	294	210	150	50
Oil: Use (MM B/D)	1.5	1.5	2.0	2.1	1.8
Output (BKHR)	313	320	425	460	385
Other Output (BKHR)	274	287	300	320	330

Note: The following abbreviations are used:

BKHR = Billion Kilowatt Hours  
 MW = Megawatts  
 MM = Millions  
 TCF = Trillion Cubic Feet

OIL DEMAND BY CONSUMING SECTOR, 1973-1990

(Percent Distribution)

<u>Sector</u>	<u>1973</u>	<u>1976 **</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>
Residential/Commercial	19.2	18.1	17.1	16.7	16.1
Industrial Fuel	11.0	11.1	12.4	11.8	11.8
Industrial Raw Material	6.4	6.5	7.1	9.0	11.4
Transportation	52.1	53.6	50.0	49.0	49.1
Electric Power	10.5	10.0	11.2	11.2	9.1
SNG	-	*	1.6	1.5	1.5
Miscellaneous	<u>0.8</u>	<u>0.7</u>	<u>0.7</u>	<u>0.8</u>	<u>0.9</u>
Total	100.0	100.0	100.0	100.0	100.0

Note: Sum of parts may not equal total due to rounding

\* Included in industrial raw material.

\*\* Preliminary

U.S. PETROLEUM SUPPLY, 1973-1990

(Million Barrels Per Day)

	<u>1973</u>	<u>1976</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>
<u>Conventional Sources</u>					
Lower 48 States (1)	10.9	9.7	8.9	8.7	8.1
North Slope Alaska	-	-	1.5	2.1	2.3
Total	<u>10.9</u>	<u>9.7</u>	<u>10.4</u>	<u>10.8</u>	<u>10.4</u>
Synthetics	-	-	-	0.3	0.8
Processing Gain	0.5	0.5	0.5	0.6	0.6
Imports	6.2	7.3	9.3	9.6	10.1
Less Exports (2)	<u>0.3</u>	<u>0.2</u>	<u>0.2</u>	<u>0.2</u>	<u>0.2</u>
Total Petroleum Supply/Demand	17.3	17.4	20.0	21.1	21.7

Note: Sum of parts may not equal total due to rounding.

(1) Includes Alaskan production outside the North Slope.

(2) Adjusted for inventory changes and unaccounted-for product losses in 1973.