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**Federal Energy
Administration**

**General
Facts
on
Energy**

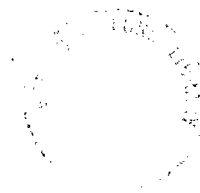
Prepared for

**FRANK G. ZARB
ADMINISTRATOR
FEA**

**Communications &
Public Affairs**

**Research
Branch**

**January
1975**



FEDERAL ENERGY ADMINISTRATION

WASHINGTON, D.C. 20461

1/17/75

Administrator Zerk:

This book will serve as a broad, general reference to many energy questions, especially for officials of Government who deal with the public.

New information appears constantly about energy. Therefore, we have arranged this book in loose leaf form so that sections may be revised and new material added.

Credit is due to the following members of my Research staff who spent months researching and compiling this information, and coordinating it with other offices of the Federal Energy Administration: Jill Meyer, Richard Seibert, Margaret Sibley, Diane Stubbs, Tina Wilson, Joan Vayo, and William Zietz, under the direction of Pauline Labrie.

We hope it will serve as a useful guide.



Robert E. Nipp, Director
OFFICE OF COMMUNICATIONS
and PUBLIC AFFAIRS



NOTE:

Sources are keyed by a number in parentheses to a list of references at the end of each chapter.



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GLOSSARY'



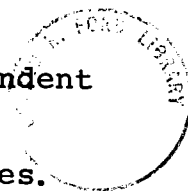
GENERAL

FEA CHRONOLOGY (1)1973

- Dec. 4: President signs Executive Order No. 11748, FEO is born; William E. Simon named Administrator.
- Dec. 4-10: Executive actions taken to staff FEO; deal with crisis (truck strike, emergency fuel allocations, gas price probes); resolve 15,000 backlog cases, start energy conservation.
- Dec. 12: FEO organization announced.
- Dec. 13: Government agencies told to cut energy use; oil exports curbed.
- Dec. 14: Seven Advisory Committees formed to give the Administrator expert counsel and information in dealing with the Nation's energy crisis.
- Dec. 15-20: FEO meets with energy users; warns on promotion of electricity; provides fuel for international airlines; asks motorists to cut gasoline use to 10 gallons per week.
- Dec. 20: Citizens asked to initiate strong energy conservation program; dial thermostats down, drive slower, weatherproof homes, cut lighting.
- Dec. 21-30: Public service ads urge conservation; utilities asked to share fuel; utilities switch to coal; gas rationing plan announced; FEO halts stockpiling of fuel; gas price gougers hit.
- Dec. 30: FEO announces resolution of 15,000 hardship cases regarding mandatory fuel allocation regulations. Most of the cases concerned the programs that went into effect on October 3 for propane and November 1 for middle distillate fuels.

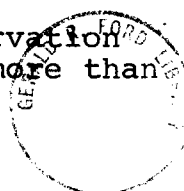
1974

- Jan. 7: FEO asks major oil companies to aid independent dealers.
- Jan. 10: FEO announces program to audit oil companies.
- Jan. 11: Truckstops continue to provide fuel.



1974

- Jan. 13: Nine electric utility plants switch to coal.
- Jan. 16: New regulations controlling flow of fuel implemented; flexibility promised.
- Jan. 22: Crude oil program announced, major refiners to share with independents.
- Jan. 25: Special Impact Office created to help low-income consumers.
- Jan. 26: FEO helps to find steel for oil drilling.
- Jan. 28: First fuel allocations announced.
- Feb. 4: Minimum purchase of gasoline urged as lines swell at pumps; daylight saving time urged.
- Feb. 7: States urged to quell panic buying at gas pump.
- Feb. 15: Nondiscrimination rule at gas pump; price reductions ordered on propane.
- Feb. 22: Energy Conservation Corps announced.
- Mar. 6: State-owned crude ruled to be controlled.
- Mar. 8: All 50 states develop energy offices and 20 have comprehensive statewide energy conservation programs.
- Apr. 4: "Operation Harvest" initiated to guarantee gasoline for migrant workers.
- Apr. 8: FEO urges permanent 55 mile per hour speed limit; first post-embargo shipment of crude arrives from Arab source.
- Apr. 17: Simon named Secretary of the Treasury; John E. Sawhill named new Administrator.
- Apr. 26: FEO and Department of Agriculture assist farmers on fuel needs.
- May 13: FEO issues the first nine energy conservation contracts, represents expenditure of more than \$1 million.



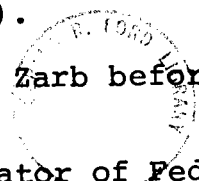
1974

- May 24: National Energy Information Center created.
- May 25: FEO issues "Tips for Energy Savers".
- June 13: First electric utility conference held to discuss problems in industry.
- June 14: FEO calls for better public transportation, releasing \$5 million to help State Energy Offices.
- June 17: FEO relaxes strict fuel allocation program.
- June 20: Sawhill names 28 distinguished Americans to Project Independence Advisory Committee.
- June 25: Federal Power Commission asked to increase natural gas supply.
- June 27: THE FEDERAL ENERGY OFFICE OFFICIALLY BECOMES THE FEDERAL ENERGY ADMINISTRATION.
- June 28: Series of public hearings announced to gain public comment on Project Independence; U.S./U.S.S.R. agreement signed to exchange energy information.
- July 10: New phase of energy conservation among business, industry announced by FEA, Commerce Department.
- Aug. 5: FEA warns major oil companies on hard-sell tactics.
- Aug. 6: First Project Independence hearing opens in Denver; FEA announces policy on synthetic natural gas.
- Aug. 7: Sawhill, Dent meet with steel executives on energy conservation.
- Aug. 15: FEA vows help for anthracite coal production in Pennsylvania.
- Aug. 29: Strict code of conduct for FEA employees announced.
- Sept. 5: FEA strengthens procedural regulations concerning appeals and grievances.
- Sept. 10: Prudent use of holiday lighting urged.



1974

- Sept. 20: FEA and EPA jointly announce results of 1975 auto tests.
- Sept. 23: Defense Production Act invoked for Alaska Pipeline construction.
- Sept. 25: FEA awards \$10 million to States for continued energy conservation and to maintain energy offices.
- Oct. 4: New U.S./USSR energy agreement signed at FEA.
- Oct. 7: Tips for motorists issued by FEA.
- Oct. 25: FEA awards first study of Public Lands for "energy parks".
- Nov. 5: New regulations on distillate fuel issued; homeowners again asked to "dial down".
- Nov. 12: FEA issued final Project Independence Report, massive effort to guide national energy policy.
- Nov. 15: Operation Button-Up announced; homeowners urged to weatherize.
- Nov. 19: Hearings set for enhanced recovery of oil refinery capacity.
- Nov. 25: New rule issued for allocating domestic aviation fuel to international carriers.
- Nov. 25: President Ford announces his intention to nominate Frank G. Zarb as FEA Administrator.
- Dec. 3: Crude equalization rule issued to equalize price of controlled crude and high priced imported crude.
- Dec. 4: One year since the creation of Federal Energy Office (the forerunner to the FEA).
- Dec. 4: Hearing on nomination of Frank G. Zarb before Senate Interior Committee.
- Dec. 18: Frank Zarb confirmed as Administrator of Federal Energy Administration.



THE EMBARGO (3)

- During the two weeks following the meeting of OAPEC ministers in Kuwait on October 17, 1973, major Arab oil producing nations imposed production cutbacks and an embargo on all petroleum shipments to the United States and the Netherlands. (See Figure 1)
- Pre-embargo (figures for September 1973) imports averaged 6.5 million barrels per day or 38 percent of U.S. petroleum consumption.
- By January, when the embargo had become fully effective, imports fell below 5 million barrels per day -- the United States was thus deprived of about 25 percent of imports and about 9 percent of total petroleum consumption.
- Estimates of the cost of the embargo to the U.S. Gross National Product (from its inception to its end in mid-March 1974) is conservatively set at \$10-20 billion.
- March 17, 1974 - Embargo on United States lifted.



EMBARGO DATES, BY COUNTRY

<u>Date</u>	<u>Country</u>	<u>Production Cutback</u>	<u>Embargoes</u>	
			<u>U.S.</u>	<u>Netherlands</u>
18 October	Saudi Arabia	10%		
	Qatar	10%		
	Libya	5%		
	Abu Dhabi		x	
	Algeria		x (orig. imposed Oct. 6)	
19 October	Libya		x	
20 October	Bahrain	5%	x	
	Saudi Arabia		x	
	Algeria	10%		
21 October	Kuwait	10%	x	
	Dubai		x	
	Qatar		x	
	Bahrain		x	
	Algeria			
22 October	Iraq			
23 October	Kuwait			x
	Abu Dhabi			x
24 October	Qatar			x
25 October	Oman		x	x
30 October	Libya			x
	Bahrain			x
2 November	Saudi Arabia			x

Source: FEA (1)

Figure 1

ENERGY LEGISLATION ENACTED INTO LAW AS OF JANUARY 1975 (2)

<u>Bill No.</u>	<u>Short Title</u>	<u>Approved</u>	<u>Public Law No.</u>
S. 398* H.R. 6168	Economic Stabilization Act Amendments (Authorizes fuel allocations)	4/30/73	93-28
S. 1081* H.R. 9130	Rights-of-way across Federal lands, insure protection of environment (Alaska Pipeline)	11/16/73	93-153
S. 1570* H.R. 9681	Emergency Petroleum Allocation Act	11/27/73	93-159
H.R. 11324* S. 2702	Daylight Saving Time Act of 1973	12/15/73	93-182
H.R. 9142*	Northeast Rail Service Act	1/2/74	93-236
H.R. 11372*	Conservation of Energy on the Nation's Highways - (55 mph Speed Limit)	1/2/74	93-239
S. 2589	National Energy Emergency Act	Vetoed 3/6/74	Sustained 3/6/74
S.J. Res. 185*	Fuel cost pass through for truckers, etc.	2/8/74	93-249
H.R. 11793* S. 2776	Create Federal Energy Administration	5/7/74	93-275
H.R. 13998*	NASA Authorization (Includes solar satellite station)	6/22/74	93-316

ENERGY LEGISLATION ENACTED INTO LAW AS OF JANUARY 1975 (cont.)

<u>Bill No.</u>	<u>Short Title</u>	<u>Approved</u>	<u>Public Law No.</u>
H.R. 14368*	Energy Supply & Coordination Act (provides environmentally acceptable means to meet U. S. fuel needs)	6/22/74	93-319
H.R. 14434*	Special Energy Research & Development Appropriations Act of 1975	6/30/74	93-322
S. 3066* H. R. 15361	Housing & Community Development Act (promotes energy conservation & use of solar energy in housing)	8/22/74	93-383
S. 3331* S. 3096	Small Business Administration Authority	8/23/74	93-386
H.R. 15205* S. 3620	Natural Gas Pipeline Safety Act Amendments of 1974	8/30/74	93-403
H.R. 11864*	Solar Heating and Cooling Demonstration Act of 1973	9/3/74	93-409
H.R. 14920* S. 2456	Authorize guaranteed loans to finance commercial ventures in the field of geothermal energy, and to coordinate Federal activities in the development of geothermal energy	9/3/74	93-410
H.R. 13999*	National Science Foundation Appropriations (Includes funds for many energy activities)	9/4/74	93-413
S. 3270* H.R. 13044	Extend Defense Production Act	9/30/74	93-426

ENERGY LEGISLATION ENACTED INTO LAW AS OF JANUARY 1975 (cont.)

<u>Bill No.</u>	<u>Short Title</u>	<u>Approved</u>	<u>Public Law No.</u>
H. R. 16102*	Daylight Saving Time Energy Conservation Act, Repeal (Amends Emergency DST Act to except last Sunday Oct. 1974 through last Sunday Feb. 1975)	10/5/74	93-434
H.R. 11510* S. 2744	Energy Research & Development Act	10/26/74	93-438
S. 3234*	Solar Energy Research & Development Act	10/26/74	93-482
H.R. 11251*	Methanol, duty suspension	10/26/74	93-485
S. 3698* H.R. 15582	Export Administration Act, regulation authority, extended	10/29/74	93-500
S. 386*	Urban Mass Transportation Act	11/26/74	93-503
H.R. 17434*	Providing for replacement of lands within the National Wildlife Refuge System that are permitted to be used for right-of-way easements and related purposes.	12/3/74	93-509
H.R. 16757*	Extension of Emergency Petroleum Allocation Act of 1973 (until 8/31/75)	12/5/74	93-511
S. 3802*	Nuclear information, Committees & Members of Congress, Jt. Committee on Atomic Energy, make available.	12/6/74	93-514

ENERGY LEGISLATION ENACTED INTO LAW AS OF JANUARY 1975 (cont.)

<u>Bill No.</u>	<u>Short Title</u>	<u>Approved</u>	<u>Public Law No.</u>
S. 433	Safe Drinking Water	12/16/74	93-523
S. 1283	Federal non-nuclear Energy Research and Development Act	12/31/74	93-577
H.R. 10701	Deepwater Ports	1/3/75	93-627
S. 3934	Federal Aid Highway Act of 1974	1/4/75	93-643
H.R. 15977	Export-Import Bank Act	1/4/75	93-646

* Bill number of Public Law

SOURCES

- (1) OFFICE OF COMMUNICATIONS AND PUBLIC AFFAIRS, FEA
- (2) OFFICE OF CONGRESSIONAL AFFAIRS, FEA
- (3) DIVISION OF PRODUCER COUNTRY AFFAIRS,
International Energy Production and Logistics,
Office of International Energy Affairs, FEA





ENERGY CONSERVATION

FEDERAL ENERGY MANAGEMENT PROGRAM (1)

- On June 29, 1973, Federal Government was directed by Presidential order to reduce anticipated use of energy by 7 percent during Fiscal Year 1974 -- Federal Energy Management Program (FEMP) was devised in response to this request.
- Sixteen agencies were involved at outset in FEMP -- among them they own 97 percent of Government vehicles; occupy 99.7 percent of Federal buildings, both owned and leased; and employ 98 percent of all Federal personnel.

- Agencies included are:

Department of Agriculture
Department of Commerce
Department of Defense
Health, Education, and Welfare
Housing and Urban Development
Department of Justice
Department of Labor
Department of State
Department of Transportation
Department of the Treasury
Atomic Energy Commission
Environmental Protection Agency
General Services Administration
NASA
Veterans Administration
Department of the Interior

- Energy conservation measures which have been implemented within these agencies include:

BUILDING OPERATIONS

Lighting - Reduction of illumination levels, removal of light bulbs or fluorescent tubes, regular scheduling of cleaning and replacement.

Heating - Decreasing temperature setting in winter by 2-4 degrees, maintenance of filters, reduction in use of outside air, insulate exposed steam lines.

Cooling - Increase temperature setting in summer by 2-4 degrees, maintenance of filters, reduction in use of outside air, insulate exposed chilled water lines.

Equipment Operation - Reduce operation of Xerox machines, reduce operation of escalators and/or elevators.

Daytime Cleaning - Change from nightly to daily cleaning.

OFFICIAL TRAVEL ACTIVITY CONSERVATION

Budget Cut - Cut in overall budget for official travel or in portion of such budget as for air travel, which is most energy-intense mode of travel.

Shift in Mode - Shift in official travel from planes to trains or buses.

Mileage Reduction - Directed or targeted saving in miles traveled due to trip elimination or consolidation.

Smaller Cars - Increase in number of smaller cars purchased, leased, or rented.

Increased Maintenance - Maintain vehicles and equipment in good operating condition to achieve maximum efficiency of operation.

Speed Limitations - Establish maximum operating speed limits for official vehicle use below legal speed limits, operate aircraft and ships at optimum speed for particular type.

Encourage off-peak travel and use of common carrier to extent feasible in performance of official duties.

Hours of Operation - Reduce operating hours.

INDIVIDUAL CONSERVATION

Encourage Mass Transit and Car Pools - Establish commuter information centers containing car pool and mass transit information, assign more parking spaces on basis of car pools.

Employee Awareness Programs - Inform employees of energy conservation program, request suggestions, establish department and regional energy conservation groups.

- FY 74 energy use reductions by quarter for the 16 participating agencies were:
 - First quarter - 21 percent
 - Second quarter - 26 percent
 - Third quarter - 30 percent
 - Fourth quarter - 20 percent
- Savings for entire fiscal year totaled 525 trillion Btu's, the equivalent of 90.5 million barrels of oil and \$725 million in avoided costs.
- Objective for Fiscal Year 74 (7 percent reduction) was exceeded by more than three times (24 percent).

ENERGY CONSERVATION WITHIN THE STATES (2)

STATEWIDE CONSERVATION PROGRAMS - (See Figure 1)

ONGOING AND PLANNED CONSERVATION PROGRAMS WITHIN STATE GOVERNMENTS - (See Figure 2)

COMMERCIAL CONSERVATION PROGRAMS WITHIN STATES

- Conservation measures undertaken and planned for in the commercial sector include:
 1. Reduction in lighting in shopping centers
 2. Reduction in work hours
 3. Minimum and maximum on thermostats for space heating and cooling
 4. Voluntary energy audits
 5. Delivery consolidation
 6. Advertising and promotion of conservation actions and suggestions



ONGOING AND PLANNED STATE ENERGY
CONSERVATION PROGRAMS (1974)

<u>Conservation Program</u>	<u>Number of States</u>	
	<u>Ongoing</u>	<u>Planned</u>
Carpooling systems	36	11
General Public Education Program	21	17
Educational Program in Schools	15	19
Appliance Labeling (Voluntary)	5	7
Appliance Labeling (Mandatory)	1	12
Study Peak Load Pricing	9	15
Special Incentive for Cars With More Than One Occupant	5	11
Improvements in Mass Transit	14	16

● Other conservation measures taken by some states include:

1. Rationing electricity
2. Enforcing 55 m.p.h. speed limit
3. Computer program to monitor electric consumption
4. Gas utilities' loan to homeowners for insulation
5. Computerized mass transit information system
6. Recyclable container law
7. State-wide energy building code

ONGOING AND PLANNED ENERGY CONSERVATION PROGRAMS
WITHIN STATE GOVERNMENTS (1974)

Conservation Program	Number of States	
	Ongoing	Planned
Purchase compact cars	36	4
Implement conservation measures in construction and operation of buildings	27	14
Reduction in lighting	39	6
Temperature control program	41	5
Carpooling for State employees	33	9
Reduction in amount of State travel	39	5
Vehicle maintenance for energy conservation	31	9

TRANSPORTATION SECTOR (3)

- Transportation sector presently accounts for approximately 25 percent of total U.S. energy consumption and about 55 percent of U.S. petroleum consumption.
- Between 1950 and 1972, annual energy consumption for passenger and freight transportation increased from 8.7 to 16.9 quads.
- Reasons for past increases in energy use include:
 1. Increased fuel availability
 2. Decreased real fuel cost
 3. Growth in per capita transportation -- especially passenger vehicle miles traveled
 4. Overall shift toward modes which are less energy-efficient
 5. Decline in energy efficiency for individual modes
- Urban bus travel is three times as efficient as auto travel.
- Rail is roughly twice as efficient as auto travel.
- Air travel is less than one-third as efficient as auto travel, one-tenth as efficient as truck for freight transport, and one-fortieth as energy efficient as rail.
- If U.S. could achieve average of 3.4 commuters per auto, could theoretically reduce auto gasoline consumption by 16 percent.
- High degree of compliance with 55 m.p.h. speed limit would reduce gasoline consumption by almost 3 percent of total auto and truck use and .5 percent of total national energy use.

ONGOING AND PLANNED TRANSPORTATION PROGRAMS

- New Car Fuel Economy - (Ongoing) - In conjunction with major automobile manufacturers, refine voluntary program aimed at achieving 40 percent increase in gasoline fuel economy in 1979 models compared with 1974 models -- install system for monitoring progress toward goal -- if voluntary program not operable, plans are to continue steps for legislation authorizing a mandatory program which might include tax credit for fuel efficient vehicles.

- New Truck Fuel Economy - (Planned) - In conjunction with major truck engine manufacturing companies and truck trailer manufacturers, establish, on voluntary basis, specific truck efficiency targets for each year through 1979, and install system for monitoring targets.
- New Car Fuel Economy Labeling - (Ongoing) - Insure implementation, in cooperation with Environmental Protection Agency, of voluntary fuel economy labeling on 1976 models.
- Efficiency of Autos and Trucks in Use - (Planned) - Continue to design, develop, and implement programs to increase efficiency (and decrease fuel consumption) of automobiles and trucks in use.
- Efficiency and Energy Conservation in Urban Public Transportation - (Planned) - Continue to design, develop and implement programs to induce motorists to shift modes of travel by making greater use of urban public mass transportation facilities.
- Better Utilization of Intercity Passenger and Freight Traffic -- Air, Rail, and Highway - (Planned) - In conjunction with other Federal departments and agencies, and private sector groups, stimulate and initiate programs to improve energy efficiency of intercity passenger travel and freight movement.
- Efficiency in Urban Truck Freight Operations - (Planned) - In conjunction with Department of Transportation, state and local governments, and private sector groups, design and suggest ways and means for obtaining better efficiency and utilization of equipment in urban truck freight operations.
- Review Federal Laws, Regulations, and Policies - (Planned) - Develop and implement comprehensive Federal effort to identify and evaluate laws, regulations, and policies which impact on transportation energy use and recommend appropriate changes.

RESIDENTIAL AND COMMERCIAL BUILDINGS SECTOR (4)

- Thirty-two percent (about 24 quads in 1972) of all energy used in United States is consumed in buildings sector

- Of total energy consumed in buildings sector, 70 percent is consumed in residential structures, 30 percent in commercial structures.
- Residential and commercial buildings sector included, in 1973, 67 million occupied housing units (single family, multi-family, and mobile homes) and 24 billion square feet of commercial space (offices, stores, and other mercantile buildings, educational facilities, hospitals, public buildings).
- Summary of primary energy uses in buildings sector:
 1. 57 percent for space heating and air conditioning
 2. 33 percent for operation of equipment, including hot water heating, home appliances, and office equipment
 3. 10 percent for lighting

COMMERCIAL BUILDINGS - ONGOING CONSERVATION PROGRAMS

Background

- Direct lighting in United States consumes slightly over 5 percent of energy used in Nation -- percentage rises to about 6 percent when indirect lighting energy consumption is considered (demand on air conditioning to overcome heat generated by lights).
- About 70 percent of energy used for lighting is consumed in commercial and industrial buildings -- estimates of possible savings through lighting economies range up to 43 percent, or over 2 percent of total national consumption.
- Commercial sector uses 42 percent of its total electricity consumption for lighting; industrial sector about 11.5 percent -- together, they account for about 260 billion Kwh of electricity per year.
- Heating and cooling buildings takes about 18 percent of Nation's total energy consumption -- about 20 percent used in commercial, public, and industrial buildings.
- Lowering temperatures 1 degree in winter and raising them 1 degree in summer can save as much as 3 percent of energy used for heating and cooling.

Lighting and Thermal Operations Conservation Program

- Voluntary program instituted and carried out with support of Regional FEA conservation specialists who work closely with state and local governments.
- Program objective is to decrease by December 1975, energy used for lighting and thermal operations in commercial, public, and industrial establishments by 25 percent -- a reduction of 300,000 barrels of oil equivalent per day.
- Program goals can be met without major economic disruption, although employment in lighting industry could be reduced in short term.
- Guidelines developed for program establish lighting levels in three major usage situations:
 1. 50 footcandles at desks and other work stations
 2. 30 footcandles in rooms and work areas
 3. 10 footcandles in halls, corridors, etc.
- Separate lighting levels are recommended for hospitals, industrial buildings, and in situations requiring increased lighting,
- Temperature guidelines of 65-68 degrees for heating, 78-80 degrees for cooling, and 55 degrees or less during non-working hours also encouraged.

RESIDENTIAL BUILDINGS - ONGOING CONSERVATION PROGRAMS

Operation Button-Up

- Ultimate goal of program is to have all residences meet minimum insulation standards by 1985.
- Presently, approximately 18 million residences do not meet minimum standards.
- If residences currently not meeting insulation standards are retrofitted, the United States could save the equivalent of 300,000 to 350,000 barrels of oil per day.
- Six inches or more of insulation in attic could pay back its cost in less than 1 to 2 years, saving homeowner up to 20 percent on fuel bills each month.
- Caulking and weatherstripping could save homeowner up to

10 percent on fuel bills per month.

- Storm windows and doors could pay for themselves in 3 to 15 years, and save up to 15 percent on heating-cooling bills per month.
- Operation Button-Up test cities include Indianapolis, Minneapolis, Kansas City, part of greater New York City, and Louisville.

Project Conserve

- Computerized home improvement analysis in which pilot studies have been conducted in Danbury, Connecticut and Topeka, Kansas.
- Under program, computer is programmed to analyze patterns of energy use for heating and cooling individual homes -- results of analysis are reported to homeowners along with recommendations for improvements and estimated costs.

INDUSTRIAL CONSERVATION (5)

- Industrial end use energy consumption accounted for 43 percent of total U.S. energy consumption and 41.5 percent of total electrical energy consumption in 1973.
- Industrial use of electric power has been doubling about every 14 years.
- Energy savings in industrial sector can be realized through series of measures:
 1. Equipment modification
 2. Periodic adjustment of combustion controls and cleaning of heat exchange surfaces in furnaces
 3. Changes in process or replacement of process to realize greater efficiency
 4. Use of waste materials as fuels and to supplement virgin materials, as in aluminum and steel industries
 5. Correct matching of equipment sizes in new systems and replacement of oversized equipment with correctly matched equipment in old systems
 6. Use of heat from various process materials, steam, flue gases, etc., rather than from primary sources such as oil, gas, and electricity
 7. Institution of energy audit to analyze energy consumption

FEA/DEPARTMENT OF COMMERCE/INDUSTRY CONSERVATION PROGRAM

- FEA, in conjunction with Department of Commerce has been developing (with cooperation of industry) energy conservation programs for the six most energy intensive industries:
 1. Aluminum
 2. Cement
 3. Chemicals and Petrochemicals
 4. Paper
 5. Petroleum Refining
 6. Steel
- Objectives of industry/government program are:
 1. Identify conservation potential within major energy consuming
 2. Identify and work to remove constraints on industry's ability to reduce energy demands
 3. Work with firms to evaluate energy usage, determine feasible industry-wide short- and long-run energy conservation goals, and encourage higher priorities for energy saving investments

4. Obtain data through monitoring program to inform public of progress in industrial conservation
 5. Identify and develop government and industry policy initiatives to spur energy conservation efforts
- Preliminary findings indicate potential additional energy savings per unit of output of about 15 percent are attainable by 1980 through greater application of conservation practices and improved technology, process, and equipment,
 - Meetings with industry resulted in the following conclusions about the six most energy intensive industries:
 1. Aluminum Industry - Consumes over 1.3 percent of Nation's total energy -- generally agreed that industry could achieve reduction in total energy use of 10 percent between 1972 and 1980 through construction of more energy efficient plants.
 2. Cement Industry - Energy cost in cement is about 20 percent of its value -- cement energy consumption represents 3.5 percent of energy consumed in all U.S. manufacturing -- sixth largest energy consumer of all manufacturing -- has great potential for conversion from oil or natural gas to coal -- total energy reduction potential of 10 percent by 1980 could be met if capital formation difficulties can be overcome and environmental criteria can be established which allow increased use of coal as primary fuel.
 3. Chemical Industry - Major fuel source is natural gas -- as natural gas shortage becomes more severe, conversion to oil as fuel and feedstock occurs, increasing oil consumption and causing production difficulties -- strong energy conservation efforts must be made to avoid increasing dependence on oil -- industry-wide savings of 15 percent by 1980 is attainable.
 4. Paper Industry - Fourth largest consumer of energy in industrial sector and largest user of fuel oils -- recoverable wastes currently meet about 40 percent of industry's energy needs -- through increased conversion to recoverable wastes as a fuel and substantial conservation efforts, savings of nearly 10 percent can be achieved by 1980 if existing pollution control requirements remain in effect.
 5. Petroleum Refining Industry - Could achieve savings of about 200,000 barrels per day of fuel oil, or 15 percent of total fuel oil usage can be obtained between 1972 and 1980 through increased attention to conservation -- one-third of potential is now being achieved,

remaining potential will require lead time to acquire and install necessary energy saving equipment.

6. Steel Industry - Accounts for 5 percent of Nation's total energy demand and 14 percent of that consumed by industry -- primary fuel used by steel industry is coal -- reduction in energy consumption eases supply pressures on other coal users (utilities) and helps to reduce demand for fuel oil -- total energy savings by 1980 should approach 10 percent.
- By end of 1975, six most energy intensive industries should be capable of reducing fuel oil consumption by roughly 100,000 barrels per day, or 10 percent of total national reduction ordered by President Ford.

ELECTRIC UTILITIES (6)

- Electricity demand in U.S. has been growing at rate of nearly 7 percent per year during post World War II period.
- Currently, a 51 percent average capacity factor exists.
- Conservation opportunities in utilities sector include:
 1. Reducing overall energy usage for electricity through conservation at end-point of use.
 2. Levelling utility peak loads, thereby enabling use of more efficient equipment, increasing capacity factors, and obviating need for expansion.
 3. Increasing conversion and transmission efficiencies.
- Specific energy conserving options available to utility industry include:
 1. Cost-Based Rates - Efficient allocation of resources required to generate and distribute electricity can best be achieved by rate structures which reflect the marginal costs in providing a given unit of electricity to a given customer. Typical existing rate structures, however, were designed to promote greater electricity consumption and are not cost-based.

These traditional rates have contributed to steadily deteriorating capacity factors and inefficient operations. Accordingly, a national rate structure would reward consumption which contributes to improved capacity factors and penalize consumption which causes further deterioration. Such modified rates would tend to be "flatter" than the typical declining block rate structures now in effect, which indiscriminately reward higher consumption patterns, and would include high charges for seasonal and daily peak load usage.

2. Load Management Technologies - In addition to peak pricing and other cost-based rates, States could encourage existing technologies for improving load factors, with or without end-use conservation. The three primary items in this category are selective load shedding, thermal storage and system interconnects. Technology currently exists for the manufacture and utilization of devices which store off-peak electricity as thermal energy, which can then be substituted for on-peak electricity in a wide variety of heating chores, including space heating, hot water, clothes drying, and lower grade industrial heating. In addition, load shedding techniques and devices would allow utilities to moderate system peaks by remotely curtailing, in whole or in part, the operation of certain previously identified customer equipment, such as residential hot water heaters or selected industrial processes. Finally, transmission interconnects would allow utilities with complementary peaking characteristics, e.g., summer peaking system and a winter peaking system, to balance their load generating requirements by sharing their load problems.
3. End-Use Conservation - A series of measures could be taken by electric utilities, under the direction of State regulatory agencies, to effect end-use conservation of electricity. Examples include promotion of:

Insulation and energy-efficient types of electrical equipment and appliances.

Solar collectors for residences and smaller commercial buildings.

Energy efficient land use and architectural design.

Recapturing of "waste heat" from refrigerators, air conditioners, etc.

- Potential energy savings of a utilities conservation program embracing all of above areas are estimated to be about 2.49 quads by 1985 at \$7 per barrel imported crude oil and 1.76 quads for \$11 per barrel oil.

ENERGY CONSERVATION PUBLIC
EDUCATION PROGRAMS (7)

PUBLIC SERVICE ADVERTISING

- Begun in January 1974 -- carried out through newspapers, magazines, posters, television, radio, brochures, and business press.
- Advertising has been carried out in three cycles, the first (January-March) focused on conservation of home heating oil and gasoline; the second (April-August) aimed at all users of energy; the third (present-indefinite) focuses on cost savings inherent in energy conservation.

PUBLIC INFORMATION PROGRAMS

Home Improvement Time (HIT)

- Co-sponsored by FEA and major energy associations (AGA, EEI, appliance manufacturers, building suppliers, equipment and hardware groups),
- Program emphasis on installing insulation, replacing inefficient appliances and equipment, and maintaining property to improve thermal efficiencies.
- Supported by 9,000-10,000 independent businessmen, local utility companies, hardware and building supply dealers, and local contractors.

Operation Button-Up

- Five-city program to achieve high compliance with FEA minimum insulation recommendations.
- Program relies heavily on local committees.
- Promotional materials, advertisements, some start-up money, coordination and monitoring provided by FEA.

SCHOOL PROGRAMS

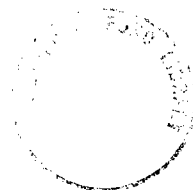
- HEW has supported FEA request for formal school programs on energy conservation.
- National Association of Science Teachers was contracted for teachers study unit, classroom materials, reference guides and take-home pieces.
- HEW also contracted with up to 20 local school boards to produce localized materials on energy conservation for inclusion in existing or new energy studies units.

Energy Conservation Corps

- FEA/UNESCO pilot program (based in New England) to involve youngsters, through high school age, in gaining understanding of and support for energy conservation in schools and the home.
- Students participate in full-day conservation seminars and return to their respective schools to relay what they have learned to their fellow students and families.

Boy Scouts of America

- Have adopted energy conservation as approved activity in Scouting, and an appropriate method for Scouts to obtain recognition, including a merit badge.
- Program will also include an extensive manual on energy conservation.
- It is anticipated that similar programs will be prepared for Campfire Girls, Girl Scouts, FFA, and 4-H (the latter two with the help of DOA's Agricultural Extension Service).



SOURCES

- (1) FEDERAL PROGRAM, December 1974, Public Education, Government and Regional Support Programs, Office of Energy Conservation and Environment, FEA
- (2) THE ENERGY PROJECT, October 12, 1974 (release date), National Governors' Conference
- (3) VEHICLE EFFICIENCY PROGRAM, December 1974, Transportation Programs, Office of Energy Conservation and Environment, FEA
- (4) BUILDINGS PROGRAMS, December 1974, Office of Energy Conservation and Environment, FEA
- (5) INDUSTRIAL RESEARCH AND DEVELOPMENT PROGRAM, December 1974, Industrial Programs, Office of Energy Conservation and Environment, FEA
- (6) RESEARCH PLANNING AND ADVANCED SYSTEMS STUDIES, December 1974, Office of Energy Conservation and Environment, FEA
- (7) PUBLIC EDUCATION PROGRAM, December 1974, Public Education, Government and Regional Support Programs, Office of Energy Conservation and Environment, FEA



OIL

BACKGROUND (1)

- First year of recorded U.S. production 1859
- Crude produced during first year 2000 barrels
- First year of marine drilling - 1938 Gulf of Mexico
- Year of largest production 1970
Amount produced 3,517,450,000 barrels
- Petroleum use surpassed coal use in 1946
- Number of States with oil/gas production - 32
- Domestic production of crude (annual total in 1,000 barrels)

1972
3,445,368

1973 (2)
3,360,903

- Crude production, month of August, 1972 9,483,000 b/d (3)
- Crude production, month of August, 1973 9,161,000 b/d (3)
- Crude production, month of August, 1974 8,918,000 b/d (3)
- Crude production, month of November, 1974 8,647,000 b/d (4)
- Production of oil (July, 1974) (5)
 - Old oil 64%
 - Released 9%
 - Stripper 15%
 - New oil 12%



Domestic Petroleum Demand 1973 (6)
(thousands of barrels)

	<u>Total</u>	<u>Daily Average</u>	<u>% Change 73/72</u>
Motor Gasoline	2,435,501	6,673	+4.4
Jet Fuels	383,355	1,050	+0.2
Distillate Fuel Oil	1,124,308	3,080	+5.4
Residual Fuel Oil	1,019,934	2,794	+10.2
Total Domestic Demand	6,297,534	17,254	+5.1

Domestic Petroleum Demand (6)
3rd Quarter 1974
(thousands of barrels)

	<u>Total</u>	<u>Daily Average</u>	<u>% Change 74/73</u>
Motor Gasoline	627,019	6,815	-2.0
Jet Fuels	98,348	1,069	+1.5
Distillate Fuel Oil	214,372	2,330	-7.2
Residual Fuel Oil	212,163	2,306	-10.9
Total Domestic Demand	1,494,754	16,247	-3.3

1973 Percentage Distribution of
Product for Refineries (6)

Motor Gasolines	43
Jet Fuel	7
Middle Distillate	23
Residual Fuel	7
Other	20



PRICING (7)Posted Crude Oil Prices

<u>Country</u>	<u>1/20</u> <u>1972</u>	<u>Dec.</u> <u>1973</u>	<u>Nov.</u> <u>1974</u>
Saudi Arabia.....	\$2.48	\$5.04	\$11.65
United Arab Emirates....	2.54	5.94	12.64
Libya.....	3.67	9.06	15.77
Canada.....	3.03	3.88	12.50
Indonesia.....	2.96	6.00	12.60
Iran.....	2.47	5.25	11.88
Nigeria.....	3.45	8.17	14.69
Venezuela Tia Juana....	3.25	7.76	14.36
Venezuela Oficina.....	3.40	8.00	14.88
United States			
o Old.....	3.39	5.25	5.25
o New.....		9.51	9.95

- OPEC uniform price (December 1974) \$10.46

Two-tier Pricing System

- Established on August 19, 1973 by Phase IV price controls as incentive to increase production.
- Released from price controls all "new" crude oil and all additional crude produced from an oil property above 1972 production levels. Equivalent additional quantity of "old" or normal production crude also released.
- November 21, 1973, the Cost of Living Council also released stripper wells from price controls.
- December, 1973, raised ceiling price on "old" crude (normal crude not subject to release with "new" crude) by \$1.00 per barrel from \$4.25 to \$5.25 per barrel.

DEPLETION ALLOWANCES (8)Percentage Oil and Gas Depletion Allowances

- First passed by Congress in 1926
- Current legislation (since 1969) allows a producer to subtract 22 percent of gross income of oil production as long as the allowance does not equal more than 50 percent of the net income from the property. Producer subtracts from the gross income the larger of percentage depletion or cost depletion to compute taxable income of each oil and gas property.
- The intent behind the percentage allowance is to permit investors to recover their capital which is invested in a depleting non-renewable resource. The tax break allows for relatively rapid capital recovery for this high risk business. This is very important to the small producer who may not have large amounts of internally generated capital to be used for the financing of new wells.

CRUDE OIL EQUALIZATION PROGRAM (9)

Background

- Certain areas of the Nation, such as the Northern-tier States, have become dependent upon imported oil to fulfill their petroleum requirements.
- The two-tier pricing system, created to encourage the production of oil, has allowed the price of new domestically produced oil to be uncontrolled.
- Refineries and businesses in the areas which are dependent upon these costly sources of petroleum have been placed in a competitive disadvantage. Furthermore, they have been locked into their contracts with their suppliers and cannot, therefore, seek new sources of cheaper oil.

The Program

- Applies to all refineries and importers of petroleum.
- Allows refineries and importers to purchase an entitlement of old oil. Entitlements are allocated on the basis of refinery runs to still and the availability of old oil. Entitlements are then exchanged to other refiners, thus allowing them to run their allocated quantity of old oil.
- The price of entitlements is controlled. Currently, entitlements are being sold for approximately \$5.00.
- The current disparity of the costs between imported oil and old oil should be reduced from its present level of \$7-8.00, to approximately \$3.00 per barrel.

SECONDARY AND ENHANCED OIL RECOVERY

Background

- As of 1/1/74, there were an estimated 435 billion barrels of oil in place (OIP) discovered in the United States. Of this total, 23.8 percent or 103 billion barrels have been produced.
- An additional 40 billion barrels can probably be produced by current proven technology and economics or about 9.2 percent of the original oil in place. These figures of course do not take into consideration new reserves additions.
- Using a base of 435 billion barrels of original oil in place, it is estimated that ultimate recovery by natural and primary means under current definitions will be in the range of 28 percent of the total OIP. In addition, it is estimated that secondary recovery will add another 5.0 percent which will result in a total of approximately 33 percent recovery of OIP by primary, secondary, and a moderate amount of tertiary recovery methods.
- The presently unrecoverable oil amounts to about 292 billion barrels. It is from this volume of unrecoverable oil that the enhanced oil recovery program has to work.

Figure 1

Oil Statistics by State (1973)

State	First year of production	Year of greatest production	Largest # bbls. of crude produced in 1 year (1,000 of bbls.)	% of crude produced by stripper wells 1973	# of Producing wells end of 1973
Alabama.....	1944	1973	11,677	0	554
Alaska.....	1905	1970	83,616	0	192
Arizona.....	1954	1968	3,370	1.8	23
Arkansas.....	1921	1925	77,398	39.3	6,424
California.....	1861	1968	375,496	18.9	43,343
Colorado.....	1862	1956	58,516	6.3	1,855
Florida.....	1943	1973	32,695	0	145
Illinois.....	1889	1940	147,647	95.0	24,307
Indiana.....	1889	1953	12,823	99.7	4,323
Kansas.....	1889	1956	124,204	68.4	42,500
Kentucky.....	1860	1959	29,272	94.1	14,416
Louisiana.....	1902	1971	935,243	.9	27,869
Maryland.....	1943	1957	4.6	0	0
Michigan.....	1899	1939	23,462	37.2	3,741
Mississippi.....	1889	1970	65,119	.7	2,310
Missouri.....	1888	1967	75	98.9	135
Montana.....	1916	1968	48,460	5.6	3,536
Nebraska.....	1939	1962	24,894	12.9	1,118
Nevada.....	1954	1966	307	0	8*
New Mexico.....	1911	1969	129,227	9.1	13,438
New York.....	1865	1882	6,685	100.0	5,400
North Dakota....	1951	1966	27,126	3.9	1,461
Ohio.....	1860	1896	23,941	70.0	15,151
Oklahoma.....	1891	1927	227,775	37.6	73,025
Pennsylvania....	1859	1891	31,424	100.0	32,595
South Dakota....	1953	1960	281	11.8	25*
Tennessee.....	1860	1971	398	12.4	67
Texas.....	1889	1972	1,301,541	9.0	152,312
Utah.....	1907	1973	32,656	.4	1,444
Virginia.....	1943	1947	16	100.0	0
West Virginia...	1860	1900	16,196	100.0	13,600
Wyoming.....	1867	1970	160,345	2.1	7,642

* estimated

Source: I.P.A.A. (1)

Figure 2

Statistics of Crude Oil Production By State

State	Average daily production per well, end of 1973	Average daily production (in barrels)			
		1970	1971	1972	1973
Alabama.....	60.1	19,899	21,458	27,142	31,992
Alaska	1,033.3	229,085	217,792	199,161	198,145
Arizona	95.3	4,880	3,386	2,713	2,203
Arkansas	7.7	49,410	50,036	50,598	49,359
California	21.2	1,019,701	982,148	948,148	920,753
Colorado	53.8	67,734	75,044	87,473	100,247
Florida	617.7	8,216	14,649	46,167	89,575
Illinois	3.4	119,855	107,080	95,284	84,025
Indiana	3.3	20,512	18,241	16,749	14,553
Kansas	4.3	232,474	215,156	201,486	181,444
Kentucky	1.7	31,712	29,293	26,508	23,800
Louisiana.....	80.9	2,484,677	2,562,310	2,426,686	2,278,148
Maryland.....	0	0	0	0	0
Michigan	10.7	32,036	32,584	35,492	40,038
Mississippi.....	66.5	178,408	175,523	166,940	153,704
Missouri	1.4	180	181	164	164
Montana	26.7	103,778	94,792	92,634	94,849
Nebraska	17.7	31,373	27,567	23,784	19,836
Nevada	33.5*	408	310	273	263
New Mexico.....	20.5	351,189	324,416	301,981	276,674
New York.....	.5	3,271	3,085	2,781	2,649
North Dakota.....	37.3	60,268	59,323	56,350	55,438
Ohio	1.6	27,025	22,701	25,568	24,099
Oklahoma.....	7.2	612,532	584,419	567,303	523,847
Pennsylvania.....	.3	11,214	10,406	9,402	8,992
South Dakota.....	30.1*	438	638	598	754
Tennessee	8.1	847	1,090	541	550
Texas	22.3	3,423,827	3,350,482	3,556,516	3,547,044
Utah	60.5	64,027	64,740	72,596	89,468
Virginia.....	0	3*	3	1	0
West Virginia....	.5	8,559	8,134	7,314	6,534
Wyoming	51.9	439,301	405,792	382,544	388,805

* estimated

Source: I.P.A.A. (1)

Figure 3

Statistics of Crude Oil Reserves by State
(Thousands of barrels)

State	Total reserves up to Jan. 1, 1974	Total production up to Jan. 1, 1974	Proved reserves Jan. 1, 1974
Alabama.....	198,688	145,085	53,603
Alaska	1,054,718*	542,505*	512,213*
Arizona	18,870	14,123	4,745
Arkansas.....	1,485,861	1,380,309	105,552
California	19,898,624	16,410,524	3,488,100
Colorado	1,345,340	1,040,550	304,790
Florida.....	258,240	74,381	183,859
Illinois	3,119,807	2,967,464	152,343
Indiana	466,058	439,436	26,622
Kansas	4,946,528	4,545,439	401,089
Kentucky	652,188	612,208	39,980
Louisiana.....	19,324,904	14,748,078	4,576,826
Maryland	0	0	0
Michigan	700,743	628,299	72,444
Mississippi	1,740,321	1,449,272	291,049
Missouri	2,170	1,725	445
Montana	1,045,341	825,998	219,343
Nebraska	366,366	338,200	28,166
Nevada	3,570	2,720	850
New Mexico.....	4,894,601	4,251,607	642,994
New York.....	223,490	215,202	8,288
North Dakota.....	594,575	415,055	179,520
Ohio	917,775	792,864	124,864
Oklahoma.....	12,240,237	10,969,273	1,270,964
Pennsylvania.....	1,319,693	1,280,083	39,613
South Dakota	4,330	3,400	930
Tennessee	2,559	1,973	586
Texas	49,962,060	38,205,447	11,756,613
Utah	736,534	472,022	264,512
Virginia	280	280	0
West Virginia.....	541,855	509,729	32,126
Wyoming	4,697,488	3,780,725	916,763

* excludes North Slope

Source: I.P.A.A. (1)

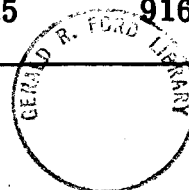


FIGURE 4

STRIPPER WELL PRODUCTION AS OF JANUARY 1, 1974

STATE	NUMBER OF STRIPPER WELLS	PRODUCTION FROM STRIPPER WELLS (Bbls.)	ABANDONMENTS	AVERAGE DAILY PRODUCTION PER WELL	ACRES
ALABAMA	39	45,666	19	3.21	2,160
ARIZONA	1	72	0	0.20	160
ARKANSAS	6,201	6,658,578	73	2.94	108,980
CALIFORNIA	31,466	61,451,588	1,042	5.35	200,680
COLORADO	867	1,919,625	84	6.07	28,290
ILLINOIS	23,960	28,826,600	644	3.30	572,940
INDIANA	4,251	5,254,207	127	3.39	294,170
KANSAS	40,176	45,948,732	1,173	3.13	1,352,926
KENTUCKY	14,201	7,314,000	397	1.41	296,633
LOUISIANA	12,649	7,324,684	562	1.59	258,731**
MICHIGAN	3,356	4,863,298	102	3.97	165,150
MISSISSIPPI	217	437,966	16	5.53	8,680
MISSOURI	137	59,796	0	1.19	1,450
MONTANA	1,295	2,143,853	29	4.53	13,660
NEBRASKA	526	1,196,417	72	6.23	29,280
NEW MEXICO	9,458	10,223,808	691	2.96	402,480
NEW YORK	5,282	969,000	544	0.50	17,500
NORTH DAKOTA	635	853,778	5	3.68	65,067
OHIO	14,906	6,157,432	440	1.13	223,590
OKLAHOMA	57,000	74,109,932	1,737	3.56	1,377,592
PENNSYLVANIA	31,539	3,282,000	1,951	0.29	662,358
SOUTH DAKOTA	12	26,734	0	6.10	1,440
TENNESSEE	53	44,767	7	2.31	515
TEXAS	82,302	112,246,894	3,884	3.74	2,388,635
UTAH	84	132,011	25	4.31	6,170
VIRGINIA	0	0	1	0	0
WEST VIRGINIA	13,500	2,407,000	26	0.49	222,750
WYOMING	1,116	1,785,089	105	4.38	39,400
TOTALS	355,229	385,683,527	13,756	2.97	8,741,387

** Estimated (No estimate furnished.)

Source: NSWA (12)

FIGURE 5

COMPARATIVE NUMBER OF STRIPPER WELLS AND STRIPPER WELL PRODUCTION

STATE	1972		1973		PERCENTAGE CHANGE IN PRODUCTION 1972-1973
	NUMBER OF STRIPPER WELLS	PRODUCTION FROM STRIPPER WELLS (Bbls.)	NUMBER OF STRIPPER WELLS	PRODUCTION FROM STRIPPER WELLS (Bbls.)	
ARIZONA	2	1,755	1	72	- 95.9
ARKANSAS	6,203	7,281,505	6,201	6,658,578	- 8.6
CALIFORNIA	31,391	65,530,767	31,466	61,451,588	- 6.2
COLORADO	807	2,024,130	867	1,919,625	- 5.2
ILLINOIS	24,363	33,128,200	23,960	28,826,600	- 13.0
INDIANA	7,570	6,108,436	4,251	5,254,207	- 14.0
KANSAS	39,853	50,447,891	40,176	45,948,732	- 8.9
KENTUCKY	14,511	9,128,000	14,201	7,314,000	- 19.9
LOUISIANA	12,907	7,598,804	12,649	7,324,684	- 3.6
MICHIGAN	3,389	4,826,191	3,356	4,863,298	+ 0.8
MISSISSIPPI	211	425,340	217	437,966	+ 3.0
MISSOURI	137	59,317	137	59,796	+ 0.8
MONTANA	1,186	1,910,388	1,295	2,143,853	+ 12.2
NEBRASKA	417	1,121,719	526	1,196,417	+ 6.6
NEW MEXICO	9,122	10,074,774	9,458	10,223,808	+ 1.5
NEW YORK	5,528	1,018,000	5,282	969,000	- 4.8
NORTH DAKOTA	749	798,134	635	853,778	+ 7.0
OHIO	14,863	6,550,632	14,906	6,157,432	- 6.0
OKLAHOMA	54,788	77,967,087	57,000	74,109,932	- 4.9
PENNSYLVANIA	32,596	3,441,000	31,539	3,282,000	- 4.6
SOUTH DAKOTA	12	25,811	12	26,734	+ 3.6
TENNESSEE	41	24,533	53	44,767	+ 82.5
TEXAS	83,666	116,635,652	82,302	112,246,894	- 3.8
UTAH	53	97,093	84	132,011	+ 36.0
VIRGINIA	1	97	0	0	-100.0
WEST VIRGINIA	13,375	2,677,000	13,500	2,407,000	- 10.1
WYOMING	1,716	2,996,423	1,116	1,785,089	- 40.4
TOTALS	359,457	411,898,679	355,190	385,637,861	6.4

Source: NSWA (12)

Figure 6

**AVERAGE ANNUAL YIELDS
FROM A BARREL OF CRUDE OIL -- 1973**

Product	Gallons Per Barrel	% Yield
Gasoline.....	19.15	45.6
Jet Fuel.....	2.86	6.8
Ethane (including ethylene).....	.08	0.2
Liquified gases.....	1.18	2.8
Kerosine.....	.72	1.7
Distillate fuel oil.....	9.45	22.5
Residual fuel oil.....	3.23	7.7
Petrochemical feed stocks.....	1.22	2.9
Special naphthas.....	.29	0.7
Lubricants.....	.63	1.5
Wax.....	.08	0.2
Coke.....	1.22	2.9
Asphalt.....	1.51	3.6
Road.....	.08	0.2
Still Gas.....	1.64	3.9
Miscellaneous.....	.17	0.4
Refinery overage.....	-1.51	-3.6
Totals	42.0	100.0

Source: API (10)



IMPORTS OF CRUDE OIL
(Thousands of barrels)

YEAR	TOTAL IMPORTS	IMPORTS FROM MID-EAST (1)	% MID-EAST TOTAL
1964	438,643	108,841	24.81
1965	452,040	121,908	26.97
1966	447,120	107,579	24.06
1967	411,649	67,977	16.51
1968	472,323	72,330	15.31
1969	514,114	61,616	11.98
1970	483,293	61,892	12.81
1971	613,417	124,155	20.24
1972	811,135	155,982	19.23
1973	1,183,996	292,988 (1)	24.75
JAN-JUL 1974	676,840	178,007	26.3

(1) Includes 2,663 from Qatar and 309 from Israel

Source FEA (11)

Figure 7

III-12

IMPORTS OF REFINED PRODUCTS

(Thousands of barrels)

YEAR	TOTAL IMPORTS	IMPORTS FROM MID-EAST ⁽¹⁾	% MID-EAST TOTAL
1964	388,093	7,323	1.89
1965	448,732	9,485	2.11
1966	492,042	8,760	1.78
1967	514,342	8,396	1.63
1968	567,046	7,683	1.35
1969	614,437	8,743	1.42
1970	764,769	5,476	.72
1971	819,463	14,966	1.83
1972	924,179	17,934	1.94
1973	1,079,527	19,707	1.83
JAN-JUL 1974	518,894		

(1) Chiefly Abu Dhabi, Iran, Iraq, Kuwait, Neutral Zone, Saudi Arabia

Source: FEA (11)

Figure 8

III-13

US Imports of Crude Oil from OPEC and Canada 1974
(Thousands of barrels)

Country	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
OPEC									
Algeria	...	...	319	2,866	10,359	10,922	10,892	11,606	6,446
Ecuador	2,803	2,508	1,730	3,271	3,373	2,226	1,951	1,019	596
Indonesia	6,299	9,950	5,729	9,955	9,350	6,204	10,939	9,666	8,003
Iran	13,534	11,810	16,716	20,064	17,814	18,163	18,676	18,071	13,384
Kuwait	...	...	...	...	...	...	...	138	438
Nigeria	14,560	12,709	14,022	22,755	16,732	12,485	29,514	29,343	25,881
Qater	...	...	...	...	...	886	1,098	955	350
Saudi Arabia	257	552	919	2,077	11,831	20,162	15,640	20,794	18,327
UAE	...	...	...	...	1,187	2,553	4,858	6,436	3,498
Venezuela	17,317	11,785	9,403	13,277	11,318	9,198	12,107	12,817	13,257
Canada	29,990	26,625	28,666	28,440	31,833	20,104	24,404	25,064	21,832

Source: FEA (13)

Figure 9

III-14

U.S. Crude Oil Imports,¹ by Source
January-September 1974

Country	Thousand b/d	Percent
Canada	868.0	23.9
Nigeria	652.0	18.0
Iran	543.0	15.0
Venezuela	404.7	11.2
Saudi Arabia	331.7	9.1
Indonesia	278.7	7.7
Algeria	195.6	5.4
Trinidad	78.5	2.2
Ecuador	71.3	2.0
United Arab Emirates	67.9	1.9
Angola	49.4	1.4
Other	84.3	2.2
Total	3,625.1	100.0
OPEC	2,549.0	70.3
Non-OPEC	1,076.1	29.7

1. Crude oil imports equal approximately two-thirds of total U.S. petroleum imports. Nearly 80% of the product imports are from the Caribbean.

Source: FEA (13)

Figure 10

III-15



SOURCES

- (1) OIL PRODUCING INDUSTRY IN YOUR STATE, 1974, Independent Petroleum Association of America.
- (2) PETROLEUM MONTHLY STATISTICS, May 1974, Bureau of Mines, Interior.
- (3) MONTHLY ENERGY REVIEW, October 1974, FEA.
- (4) PETROLEUM SITUATION REPORT, 1974, FEA.
- (5) MONTHLY ENERGY REVIEW, November 1974, FEA.
- (6) NATIONAL ENERGY INFORMATION CENTER, Office of Policy Analysis, FEA.
- (7) OFFICE OF OIL AND GAS, Office of Energy Resources Development, FEA.
- (8) OFFICE OF FINANCE AND INCENTIVES, Office of Energy Resources Development, FEA.
- (9) ALLOCATIONS, REGULATIONS, DEVELOPMENT BRANCH, Office of Operations, Regulations and Compliance, FEA.
- (10) AVERAGE YIELD FROM A BARREL OF CRUDE OIL, 1973, American Petroleum Institute.
- (11) R. SHRIVER ASSOCIATES, September 1974, Federal Energy Administration Contractor/Chase Manhattan Energy Data.
- (12) NATIONAL STRIPPER WELL SURVEY, January 1 1974, Interstate Oil Compact Commission and National Stripper Well Association
- (13) DIVISION OF PRODUCER COUNTRY AFFAIRS, December 1974, Office of International Energy Affairs, FEA





REFINERIES

BACKGROUND

- Historical growth rate for refined products shows average increase of 3.2 percent per year from 1961 to 1965, 5.1. percent from 1966 to 1970. (2)
- Future demand for petroleum products is expected to grow at a significantly lower rate due to conservation and high oil prices. (3)
- Petroleum refining is the processing of crude oil. This is an exceedingly complex operation in which over 3,000 products are produced wholly or in part from petroleum. In addition, over 3,000 petrochemicals are produced by this process. (1)
- Among the products produced as a result of the refining process are: Heating oils, motor fuels, plastics, building materials, synthetic fibers, medicine, rubber, paint, nylon, aspirins, solvents, and explosives. (1)

THE REFINERY PROCESS

- The material to be distilled is continuously pumped through a heat exchanger train where it absorbs heat from hot products leaving the still. (3)
- The material is then pumped through a furnace where more heat is absorbed by passing it through tubes on the furnace walls. (3)
- The fully-heated material is then flashed into the lower section of a fractionation tower. Here, the heavier material or residual fuel drops to the bottom of the tower and is drawn off. (3)



- All of the lighter fractions vaporize and rise upward through a series of fractionating trays. (3)
- A temperature gradient is maintained over the tower by pumping cool liquid naphtha to the top of the tower. As a result, products such as heating oil and kerosene condense in the central part of the tower where they are drawn off. The lower boiling point naphtha continues to the top of the tower where it is drawn off, cooled, and condensed. (3)

Fractions of the Refining Process

<u>Product</u>	<u>Approximate boiling range (Centigrade)</u>
refinery gas	below room temperature
petroleum ether	20-60°
light naphtha	60-100°
gasoline	50-200°
kerosene	175-275°
gas oil (furnace oil, diesel oils)	about 275°
lubricating oils	not distilled at atmospheric pressure
waxes	not distilled at atmospheric pressure
asphalt	residue

- Figure 1 is typical of petroleum refining operations. (4)

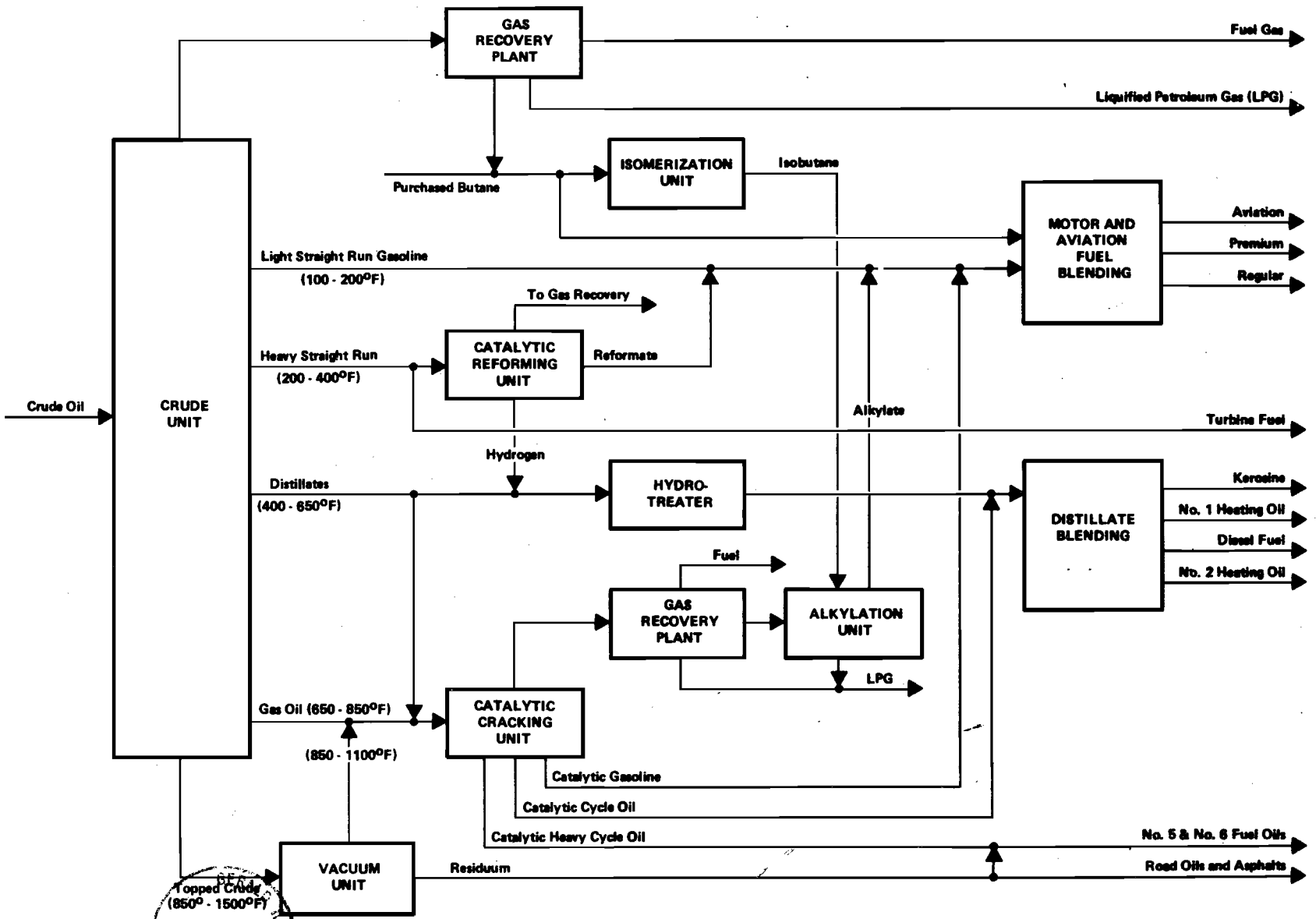
NUMBER AND LOCATION OF REFINERIES

- On January 1, 1974, there were 284 refineries in the United States, 27 of which were shutdown. Shutdowns may be temporary (e.g. for repairs) or permanent (e.g. obsolescence). (5)
- These refineries can be found in 41 states. (5)
- The leading states and their respective number of refineries: (5)

Texas - 48
California - 38
Louisiana - 21
Wyoming - 13
Oklahoma - 13

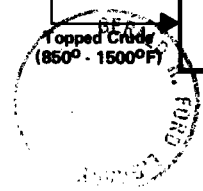
Pennsylvania - 12
Illinois - 12
Indiana - 11
Kansas - 11
Montana - 10





Source: NPC (2)

Figure 1



- These 10 states, with a total of 189 refineries, represent two-thirds of the entire total. (5)

Location of Refineries in Relation to Petroleum Supply

- Often the producing area is not located near the refining area.
- 86 percent of the domestic movement of oil to refineries travels through an oil pipeline. (9)
- Figure 2 illustrates the relationship between refining area and producing area, showing pipeline routes. (6)
 - District 3 is a major source of petroleum products for both Districts 1 and 2.
 - Districts 1 and 2 have either inadequate refinery capacity or limited crude oil supply.
 - Nearly half of the petroleum products consumed on the East Coast come from Gulf Coast refineries. This is mainly because of limited refinery capacity along the Atlantic Coast.
 - In the absence of greatly expanded East Coast refinery capacity, product movements from the Gulf Coast to District 1 are expected to increase by approximately 63 percent by 1985.
- The 284 refineries have a total operable crude oil distillation capacity of 14.6 million barrels per day. (5)
- The capacity of a refinery may range from 390 bbl/d (Mountaineer Refining Co. at LaBarge, Wyoming) to 445,000 bbl/d (Exxon at Baton Rouge, Louisiana). (See Figure 4) (9)
- The number of refineries in the United States is not necessarily an indicator of our domestic refining capacity. In 1964 the 304 existing refineries had a combined operable production capacity of approximately 10.3 million barrels of crude daily. Ten years later 284 refineries had a total of 14.6 million barrels per day.

CRUDE OIL PIPELINE ROUTES

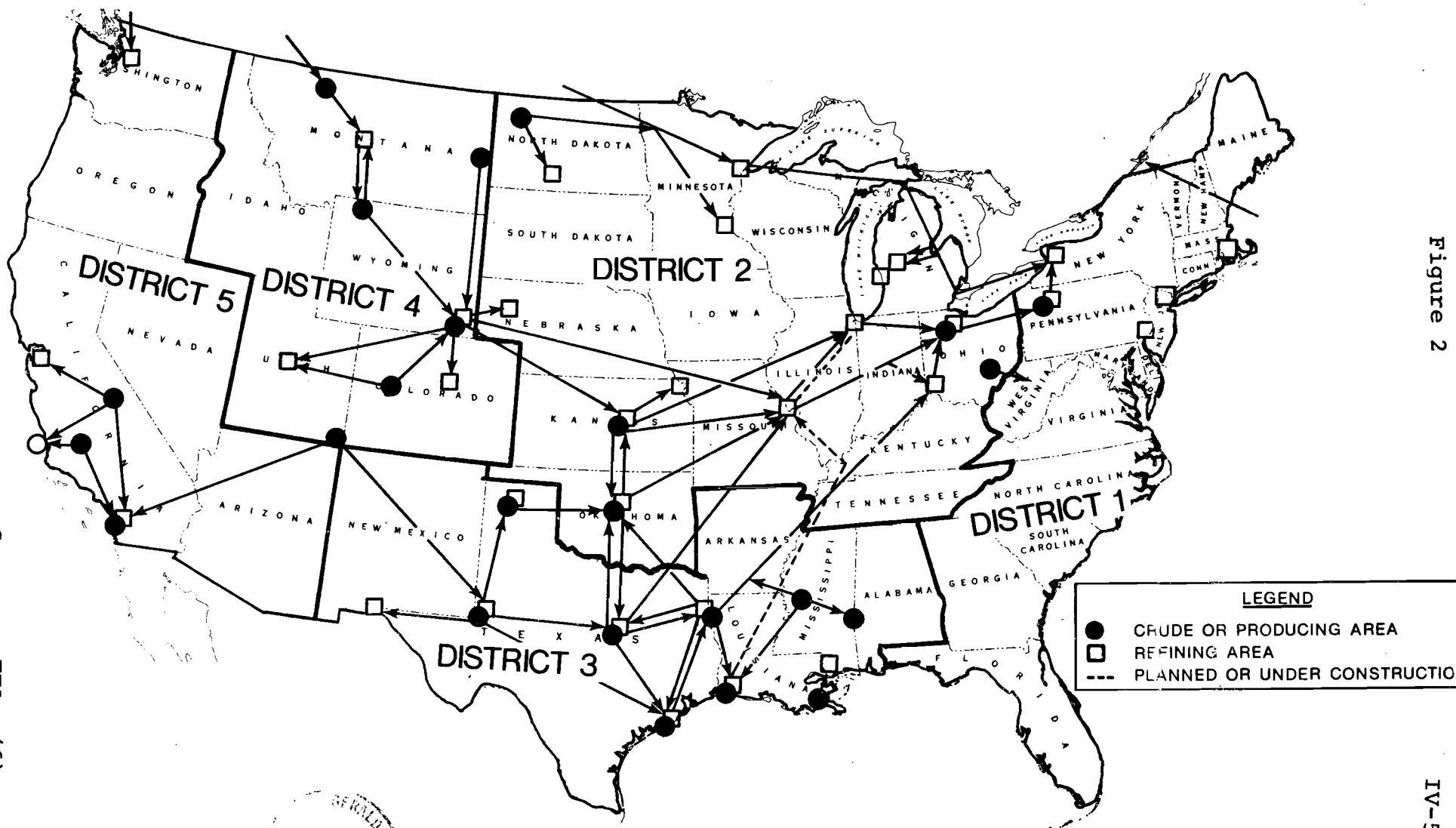


Figure 2



- Four States represent well over one-half of the operable crude oil distillation capacity: (9)

<u>State</u>	<u>Capacity</u>
Texas	3,806,246
California	1,800,437
Louisiana	1,698,450
Illinois	1,155,920
Total	8,461,053

- The next 6 states ranked in order of capacity are: (9)

<u>State</u>	<u>Capacity</u>
Pennsylvania	693,820
New Jersey	622,000
Ohio	589,800
Indiana	557,000
Oklahoma	486,035
Kansas	411,805
Total	3,360,460

- These 10 states, with a total operable capacity of 11,821,513 barrels per day, represent 81 percent of the total crude oil distillation capacity in the United States. (5)
- Figure 3 illustrates the relationship between refinery capacity and demand during the last decade. (5)
- Since the 1960's, a shortfall in refining capacity has been developing, and total product imports have been increasing sharply. (2)
- In the 10 year period, January 1, 1962, to January 1, 1972, additions to capacity totaled 5.4 million barrels per day, while reductions to capacity totaled 2.1 million barrels per day. (2)
- Nearly 78 percent of the added capacity was a result of expansion or additions to existing facilities. (2)
- New refineries were also constructed during this period; they accounted for 1.2 million barrels per day of capacity additions. (2)

Relationship Between Refinery Capacity and Demand

Year	Refining Capacity (bbls)	Refined Products Domestic Demand (bbls)	Refined Capacity Excess (+) Deficit (-) (bbls)	Demand as a % of Capacity
1964	10,305,774	11,022,503	- 716,729	107.0
1965	10,419,851	11,512,436	- 1,092,585	110.5
1966	10,393,839	12,084,373	- 1,690,534	116.3
1967	10,658,407	12,560,345	- 1,901,938	117.8
1968	11,353,404	13,392,866	- 2,039,462	118.0
1969	11,702,309	14,136,795	- 2,434,486	120.8
1970	12,021,273	14,697,186	- 2,675,913	122.3
1971	12,860,228	15,212,493	- 2,352,265	118.3
1972	13,292,468	16,366,984	- 3,074,516	123.1
1973	13,671,384	17,253,517	- 3,582,133	126.2

The above table shows that since 1964 the refining capacity of the United States has not been adequate to meet the domestic demand for refined products.



Source: Interior (5)

Figure 3

IV-7

CONSTRAINTS TO INCREASING REFINERY CAPACITY

- Construction Costs - Costs may, of course, vary greatly. Generally, a great amount of capital outlay is required. A refinery which can produce 150,000 barrels per day requires an outlay of about \$2,000 per barrel per day or about \$300 million. Expansion of existing facilities costs about \$900 to \$1,500 per barrel per day. (8)
- Long Lead Time - A major facility requires 3 to 6 years. Among the potential factors are: coordination between Federal, State, and local officials, locating a suitable site, obtaining permission, licensing, and the holding of public hearings. (2)
- Environment - Refineries must meet environmental standards. Facilities must meet ambient air quality standards or be on schedule for installing the necessary equipment. New refineries will include current emission and effluent control systems. Solid waste disposal procedures must be developed. Expenditures for environmental needs often cost in excess of 10 percent of all refinery investment. (2)
- Materials - Refinery construction depends very often on suppliers delivering material on time. Some equipment, such as reactors, may require from 57 to 84 weeks from placement of order to date of delivery. In addition, steel is in short supply both here and abroad. Heat exchangers, compressors, turbines, pumps, and piping are also difficult to acquire. (2)
- Manpower - Technical manpower necessary to meet future construction schedules appears to be dwindling. In 1970 there were 84,000 enrolled in engineering courses, and in 1972, only 46,000. It is expected that the requirements for engineers and designers in the refinery industry will increase by 80 percent in the next 10 years. (2)
- Right Type of Crude Oil - Many refineries have been constructed to operate "sweet" (low sulfur) crude oil. Others operate with "sour crude" (high sulfur). An accurate assessment of refinery capacity must take crude type into account, since refineries must be specially built to conform to one type or the other. (2)

REFINERY AUDIT AND REVIEW PROGRAM (RARP)

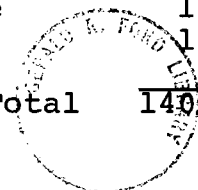
- Set up by FEA to maintain close surveillance over oil company records. The key elements in this refinery audit are to:
 - Determine that only allowable products costs are passed through the pricing formula in Section 212 of the Federal Energy Guidelines.
 - Determine whether price increases are passed on uniformly to classes of purchasers within the same product line.
 - Audit imported and domestic crude costs for compliance with regulations.
 - Review cost support of non-product costs and compliance with regulations.
 - Perform special audit projects for policy-making, court suits, and others.
 - Insure that the intent of the regulations is not being subverted.
- Currently, the size of the FEA RARP staff is 188, and a force of 143 auditors reviews prices charged by crude oil producers.
- RARP investigates 125 refiners, and audits are conducted in cycles of approximately 4 months.
- Each of the 35 refiners in Figure 4 is staffed on a continuing basis (an FEA representative is on site at all times). The majority produce at least 75,000 barrels of oil per day and account for approximately 90 percent of the refined crude oil produced in the United States.



REFINERS STAFFED ON CONTINUING BASIS BY RARP (3)

<u>Refiner</u>	<u>Company Headquarters</u>	<u>Number of Refineries</u>
Continental Oil	Houston, Texas	8
Texaco	Houston, Texas	12
Tenneco	Houston, Texas	1
Exxon	Houston, Texas	5
Shell Oil	Houston, Texas	8
Gulf Oil	Pittsburgh, Penna.	8
Clark Oil and Refining	Milwaukee, Wisconsin	2
Standard of Indiana	Chicago, Illinois	10
Amerada Hess	Newark, New Jersey	2
Standard of Ohio	Cleveland, Ohio	3
Union Oil	Los Angeles, California	5
Atlantic Richfield	Los Angeles, California	5
Standard of California	San Francisco, California	9
Coastal States Petro.	Houston, Texas	2
American Petrofina	Dallas, Texas	4
Champlin Petroleum	Ft. Worth, Texas	3
Koch Industries	Wichita, Kansas	1
Farmland Industries	Kansas City, Kansas	3
Phillips Petroleum	Bartlesville, Oklahoma	6
Kerr McGee	Oklahoma City, Oklahoma	4
Cities Service	Tulsa, Oklahoma	1
Tesoro Petroleum	San Antonio, Texas	4
Sun Oil	Philadelphia, Penna.	5
Crown Central Petro.	Baltimore, Maryland	1
Mobil Oil	New York, New York	9
Commonwealth Oil	New York, New York	1
Ashland Oil	Ashland, Kentucky	6
Marathon Oil	Toledo, Ohio	3
Getty	Los Angeles, California	1
Skelly	Tulsa, Oklahoma	1
Murphy	El Dorado, Arkansas	2
Diamond Shamrock	Amarillo, Texas	1
Charter Oil	Jacksonville, Florida	2
Delta	Memphis, Tennessee	1
Pace Oil	Greensboro, N.C.	1

Total 140



Capacity of petroleum refineries in the United States and Puerto Rico: January 1, 1974
(Barrels per calendar day)

Company	Location	Crude oil distillation		Cracking, reforming, coking, and alkylation				Other products ²
		Operating	Shutdown	Type of Process ¹	Gasoline output			
					Operating and Shutdown	Operating	Shutdown	
ALABAMA								
Alabama Refining Company, Inc.	Theodore	15,000	-	-	-	-	-	-
Cracker Asphalt Corporation ⁴	Moundville	-	1,400	-	-	-	-	A
Hunt Oil Company	Tuscaloosa	15,600	-	Cat. Rf.	1,500	1,200	-	A
Vulcan Asphalt Refining Company	Cordova	3,500	-	-	-	-	-	A
Warrior Asphalt Corporation	Holt	3,000	-	-	-	-	-	A
ALASKA								
Standard Oil Company of California	Kenai	22,000	-	-	-	-	-	A
Tesoro-Alaskan Petroleum Corporation	do.	38,000	-	-	-	-	-	-
ARIZONA								
Arizons Fuels, Inc.	Fredonia	2,000	7,000	-	-	-	-	A
ARKANSAS								
Berry Petroleum Company, a subsidiary of Crystal Oil Company	Stephens	3,600	-	-	-	-	-	A
Cross Oil and Refining Company of Arkansas	Smackover	4,200	800	-	-	-	-	A-L
Lion Oil Company, a subsidiary of The Oil Shale Corporation	El Dorado	45,000	-	Cat. Ck. Cat. Rf. Alk.	15,000 7,500 4,700	8,500 6,400 4,500	-	A-L
Macmillan Ring-Free Oil Company, Inc.	Norphlet	4,400	-	-	-	-	-	A-L
CALIFORNIA								
Atlantic Richfield Company	Carson	165,000	-	Cat. Ck. Cat. Rf. Hydro. Cok. Thml. Ck. Alk.	50,600 31,500 17,000 28,740 50,850 10,770	26,000 26,000 17,460 5,330 5,590 7,000	-	K
Bescon Oil Company	Hanford	12,100	-	Cat. Rf. Thml. Ck.	1,650 3,375	1,485 1,100	-	-
Champlin Oil Company	Wilmington	28,767	-	Cok.	9,600	2,000	-	K
Douglas Oil Company of California	Paramount	35,000	-	Cat. Rf.	6,200	5,000	-	A
Edgington Oil Refinerles, Inc.	Santa Maria	8,000	-	-	-	-	-	A
Edgington Oxnard Refinery	Long Beach	22,500	-	-	-	-	-	A
Exxon Company, U.S.A.	Oxnard	2,500	-	-	-	-	-	A
	Benicia	87,000	-	Cat. Ck. Cat. Rf. Hydro. Cok. Alk.	40,500 22,800 20,900 20,500 12,000	20,000 19,400 20,700 3,500 10,900	-	K
Fletcher Oil and Refining Company	Carson	16,000	-	Cat. Rf.	4,350	3,741	-	-
Golden Eagle Refining Company, Inc. (formerly Carson Oil Company)	do.	-	13,000	-	-	-	-	-
Gulf Oil Corporation	Santa Fe Springs	51,500	-	Cat. Ck. Cat. Rf. Hydro. Thml. Ck. Alk.	12,900 17,800 10,300 12,800 5,400	7,224 15,000 3,050 400 2,800	-	A
Kern County Refinery, Inc.	Bakersfield	12,900	-	Cat. Rf. Thml. Ck.	2,500 6,200	2,125 1,240	-	-
Lubrication Company of America	Saugus	500	-	-	-	-	-	L
Lunday-Thagard Oil Company	South Gate	3,000	-	-	-	-	-	A
Macmillan Ring-Free Oil Company, Inc.	Signal Hill	10,000	-	-	-	-	-	A
Mobil Oil Corporation	Torrance	123,500	-	Cat. Ck. Cat. Rf. Hydro. Cok. Thml. Ck. Alk.	51,400 34,800 16,200 42,200 15,200 13,600	24,150 27,850 17,800 9,300 - 9,600	-	K
Mohawk Petroleum Corporation	Bakersfield	18,600	3,500	Cat. Rf.	2,500	2,200	-	-
Newhall Refining Company, Inc.	Newhall	8,500	-	-	-	-	-	A
Phillips Petroleum Company	Martinez	110,000	-	Cat. Ck. Cat. Rf. Hydro. Cok. Alk.	47,000 32,500 22,000 42,000 17,800	17,000 25,000 23,000 10,000 10,000	-	K
Powerline Oil Company	Sante Fe Springs	28,500	-	Cat. Ck. Cat. Rf. Hydro. Alk.	10,000 6,750 1,800 2,100	6,000 6,000 1,000 1,000	-	-
Road Oil Sales, Inc.	Bakersfield	1,000	2,000	-	-	-	-	-
Sabre Oil and Refining Company	do.	2,500	-	-	-	-	-	-
San Joaquin Oil Company	do.	27,000	-	-	-	-	-	A
Sequoia Refining Corporation, a wholly-owned subsidiary of Gulf Oil Corporation	Hercules	27,000	-	Cat. Rf. Hydro.	15,000 2,700	14,000 2,700	-	-
Shell Oil Company	Martinez	100,000	-	Cat. Ck. Cat. Rf. Hydro.	43,200 24,300 17,500	17,000 20,500 19,300	-	A-L
	Wilmington	90,000	6,000	Cat. Ck. Cat. Rf. Cok. Alk.	33,000 18,500 27,000 11,100	16,300 15,700 6,000 8,300	-	K
Standard Oil Company of California	Bakersfield	26,000	-	Cat. Rf. Thml. Ck.	5,000 9,000	4,500 -	-	A
do.	El Segundo	230,000	-	Cat. Ck. Cat. Rf. Hydro. Cok. Alk.	40,000 55,000 45,000 50,000 5,600	18,000 51,000 50,000 12,500 5,400	2,800	A-K

See footnotes at end of table.

Capacity of petroleum refineries in the United States and
Puerto Rico: January 1, 1974 (Continued) IV-12
(Barrels per calendar day)

Company	Location	Crude oil distillation		Cracking, reforming, coking, and alkylation				Other products ²
		Operating	Shutdown	Type of Process ¹	Gasoline output			
					Operating and Shutdown	Operating	Shutdown	
CALIFORNIA (cont.)								
Standard Oil Company of California	Richmond	190,000	-	Cat. Ck. Cat. Rf. Hydro. Alk.	40,000 65,000 62,000 8,700	20,000 62,200 41,000 8,500	-	A-L-W
Sunland Refining Corporation ⁴	Bakersfield	8,800	-	Cat. Rf.	1,000	950	-	-
Tenneco Oil Company	Bakersfield	-	1,200	-	-	-	-	-
Texaco Inc.	Wilmington	90,000	-	Cat. Ck. Cat. Rf. Hydro. Cok. Alk.	28,000 35,000 20,000 748,000 4,700	11,000 30,600 20,000 9,000 4,400	-	K
Toacopetro Corporation	Bakersfield	26,570	-	Cat. Ck. Cat. Rf. Hydro. Cok. Alk.	10,000 14,200 12,000 7,000 3,500	4,000 12,500 12,000 600 1,800	-	K
Union Oil Company of California	Arroyo Grande	41,000	-	Cok.	22,500	4,200	-	A-K
Do	Rodeo	70,000	-	Cat. Rf. Hydro. Cok.	22,500 27,000 17,300	21,000 27,000 3,000	-	A-K-L-W
Do	Wilmington	108,000	-	Cat. Ck. Cat. Rf. Hydro. Thml. Ck. Alk.	42,300 26,000 19,000 18,500 9,800	19,000 22,000 19,000 2,000 7,500	-	A
West Coast Oil Company	Oildale	15,000	-	-	-	-	-	A
Witco Chemical Corporation, Golden Bear Division	do	11,000	-	-	-	-	-	A-L
COLORADO								
Continental Oil Company	Danver (Commerce City)	30,000	-	Cat. Ck. Cat. Rf. Thml. Ck.	14,500 6,100 4,500	9,000 5,500	-	A
Gary-Western Company (formerly American Gilsonite Company)	Gilsonite	-	-	Cat. Rf. Cok.	2,500 78,300	1,400 5,500	2,800	K
Morrison Refining Company	Grand Junction	-	1,000	-	-	-	-	-
The Refinery Corporation	Danver (Commerce City)	17,500	-	Cat. Ck. Cat. Rf. Thml. Ck.	7,500 3,800 6,000	5,100 3,200 300	-	-
DELAWARE								
Getty Oil Company	Delaware City	140,000	-	Cat. Ck. Cat. Rf. Hydro. Cok. Alk.	60,000 37,000 14,600 39,300 13,500	31,200 27,000 5,000 8,600 7,400	-	K
FLORIDA								
Seminole Asphalt Refining, Inc.	St. Marks	5,000	-	-	-	-	-	A
GEORGIA								
Amoco Oil Company	Savannah	12,000	-	-	-	-	-	A
Young Refining Corporation	Douglasville	2,500	-	-	-	-	-	A
HAWAII								
Standard Oil Company of California	Honolulu	40,000	-	Cat. Ck. Alk.	13,000 3,800	7,800 3,800	-	A
ILLINOIS								
Amoco Oil Company	Wood River	107,000	-	Cat. Ck. Cat. Rf. Alk.	38,000 12,300 7,000	21,000 10,500 5,500	-	A
Clark Oil and Refining Corporation	Blue Island	70,000	-	Cat. Ck. Cat. Rf. Hydro. Alk.	25,900 30,000 11,000 8,000	15,000 24,000 3,000 5,800	1,200	-
Do	Hartford	38,000	-	Cat. Ck. Cat. Rf. Cok. Alk.	26,000 9,200 13,000 7,500	22,000 9,000 2,250 7,500	-	K
Marathon Oil Company	Robinson	195,000	-	Cat. Ck. Cat. Rf. Hydro. Cok. Thml. Ck. Alk.	35,000 47,400 20,400 18,200 2,800 15,050	23,900 25,900 7,600 4,950 1,500 7,800	11,000	K
Mobil Oil Corporation	Joliet	175,000	-	Cat. Ck. Cat. Rf. Cok. Alk.	62,700 42,300 26,600 20,700	32,700 37,200 3,600 20,700	-	K
Richards, M. T., Inc.	Crossville	-	720	-	-	-	-	-
Shell Oil Company	Wood River	260,000	-	Cat. Ck. Cat. Rf. Hydro. Thml. Ck. Alk.	75,000 80,500 30,000 19,000 25,000	40,000 65,000 32,000 2,000 15,900	-	A-L-W

See footnotes at end of table.

Capacity of petroleum refineries in the United States and
Puerto Rico: January 1, 1974 (Continued)
(Barrels per calendar day)

IV-13

Company	Location	Crude oil distillation		Cracking, reforming, coking, and alkylation				Other products ²	
		Operating	Shutdown	Type of Process ¹	Charge		Gasoline output		
					Operating and Shutdown	Operating	Shutdown		
ILLINOIS (Cont.)									
Texaco Inc.	Lawrenceville	84,000	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	31,000 24,000 9,000 3,300	17,000 20,000 4,000 3,000	- - - -	A	
Do	Lockport	72,000	-	Cat. Ck. Cat. Rf. Cok. Alk.	30,000 19,000 27,000 4,800	14,000 16,300 3,000 4,400	- - - -	K	
Union Oil Company of California	Lemont	152,000	-	Cat. Ck. Cat. Rf. Cok. Alk.	48,600 28,500 18,800 13,100	29,500 23,300 1,450 12,300	- - - -	K	
Wireback Oil Company ⁴	Plymouth	1,200	-	-	-	-	-	-	
Yetter Oil Company	Colmar	1,000	-	-	-	-	-	-	
INDIANA									
Amoco Oil Company	Whiting	315,000	-	Cat. Ck. Cat. Rf. Cok. Alk.	118,000 113,000 14,500 23,000	58,000 45,000 3,000 19,000	- 37,000 - -	A-K-L-W	
Atlantic Richfield Company	East Chicago	126,000	-	Cat. Ck. Cat. Rf. Alk.	48,600 41,500 7,200	25,000 16,800 6,000	- 317,500 -	A	
Cities Service Oil Company	do	-	36,000	Cat. Ck. Cat. Rf. Cok. Alk.	26,000 10,500 22,800 5,500	- - - -	313,000 38,610 32,750 25,100	K	
Crystal-Princeton Refining Company (formerly R. J. Oil and Refining Company, Inc.)	Princeton	-	34,300	Cat. Rf. Thml. Ck.	1,500 2,000	- -	31,500 32,000	-	
Gladieux Refinery, Inc.	Fort Wayne	5,500	-	-	-	-	-	-	
Indiana Farm Bureau Cooperative Association, Inc.	Mt. Vernon	15,500	-	Cat. Ck. Cat. Rf. Alk.	5,000 3,000 2,600	3,250 2,650 1,800	- - -	-	
Laketon Asphalt Refining Company	Laketon	8,500	-	-	-	-	-	A	
Mobil Oil Corporation	East Chicago	47,000	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	18,500 10,400 7,300 2,900	10,300 8,500 1,400 2,200	- - - -	-	
Rock Island Refining Corporation	Indianapolis	29,500	-	Cat. Ck. Cat. Rf. Alk.	14,400 6,200 2,540	9,600 5,400 2,500	- - -	A	
Somerset Refinery, Inc.	Troy	-	31,500	-	-	-	-	-	
Witco Chemical Corporation, Pioneer Products Division	Hammond	-	10,000	-	-	-	-	-	
KANSAS									
American Petrofina Company of Texas	El Dorado	25,000	-	Cat. Ck. Cat. Rf. Alk.	11,500 4,000 2,500	6,500 3,500 2,000	- - -	A	
APCO Oil Corporation	Arkansas City	26,000	-	Cat. Ck. Cat. Rf. Hydro. Alk.	9,200 6,350 3,000 3,750	5,900 5,600 3,000 2,300	- - - -	A	
CRA, Inc.	Coffeyville	41,500	-	Cat. Ck. Cat. Rf. Cok. Alk.	13,500 8,600 8,500 6,100	7,100 7,700 1,300 3,400	- - - -	A-K-L-W	
Do	Phillipsburg	20,500	-	Cat. Ck. Cat. Rf. Alk.	7,000 4,000 2,500	4,800 3,600 1,400	- - -	A	
Derby Refining Company	Wichita	27,982	-	Cat. Ck. Cat. Rf. Cok. Alk.	10,176 4,800 3,800 4,032	5,700 4,176 985 2,782	- - - -	K	
Mid-America Refining Company, Inc.	Chanute	3,000	-	-	-	-	-	A	
Mobil Oil Corporation	Augusta	50,000	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	19,900 20,000 3,900 3,500	10,500 8,200 1,050 3,500	- 8,200 - -	A	
National Cooperative Refinery Association	McPherson	54,150	-	Cat. Ck. Cat. Rf. Cok. Alk.	19,000 7,000 14,000 8,100	10,150 5,800 1,700 6,500	- - - -	K	
North American Petroleum Corporation	Shallow Water	-	5,000	Cat. Ck. Alk.	2,250 1,200	- -	1,600 700	A	
Phillips Petroleum Company	Kansas City	85,000	-	Cat. Ck. Cat. Rf. Alk.	32,000 16,000 8,200	16,000 15,000 7,500	- - -	A-L	
Skelly Oil Company	El Dorado	73,664	-	Cat. Ck. Cat. Rf. Cok. Alk.	29,301 20,380 11,160 10,284	17,704 16,536 2,443 6,505	- - - -	A	
KENTUCKY									
Ashland Oil, Inc.	Catlettsburg	135,800	-	Cat. Ck. Cat. Rf.	52,400 23,000	32,000 19,000	- -	A	
Kentucky Oil and Refining Company ⁴	Betsy Layne	500	-	-	-	-	-	-	
Louisville Refining Company, Inc., a Division of Ashland Oil, Inc.	Louisville	25,200	-	Cat. Ck. Cat. Rf.	9,000 3,000	5,500 2,500	- -	A	
Somerset Refinery, Inc.	Somerset	2,000	1,000	-	-	-	-	-	

See footnotes at the end of table.

Capacity of petroleum refineries in the United States and Puerto Rico; January 1, 1974 (Continued)
(Barrels per calendar day)

IV-14

Company	Location	Crude oil distillation		Cracking, reforming, coking, and alkylation				Other products ²
		Operating	Shutdown	Type of Process ¹	Gasoline output			
					Operating and Shutdown	Operating			Shutdown
LOUISIANA								
Inland:								
Atlas Processing Company, a subsidiary of Pennzoil Company	Shreveport	29,000	-	Cat. Rf.	10,000	8,500	-	-
Bayou State Oil Corporation	Hosston	2,000	-	-	-	-	-	A-L
Do	Do	1,500	-	-	-	-	-	-
Calumet Refining Company, a Division of Calumet Industries, Inc.	Princeton	2,400	-	-	-	-	-	A-L
Claiborne Gasoline Company	Lisbon	6,500	-	Cat. Rf.	3,800	2,000	-	-
Cotton Valley Solvents Company	Cotton Valley	7,000	1,000	-	-	-	-	-
Kerr-McGee Corporation	Dubach	11,000	-	Cat. Rf.	4,350	3,480	-	-
Gulf:								
Canal Refining Company	Church Point	3,500	-	Cat. Rf.	1,500	1,250	-	-
Citias Service Oil Company	Lake Charles	268,000	-	Cat. Ck.	130,000	55,000	-	K
				Cat. Rf.	46,000	38,000	-	-
				Hydro.	6,000	1,600	-	-
				Cok.	28,000	7,000	-	-
				Alk.	44,000	33,000	-	-
Continental Oil Company	Egan	15,000	-	Cat. Rf.	4,000	3,488	-	-
Do	Westlake	83,000	-	Cat. Ck.	27,000	13,500	-	K
				Cat. Rf.	17,800	15,100	-	-
				Cok.	8,500	1,200	-	-
				Thml. Ck.	6,000	1,200	-	-
				Alk.	7,900	4,200	-	-
Evangeline Refining Company, Inc.	Jemings	4,000	-	Cat. Rf.	600	600	-	-
Exxon Company, U.S.A.	Baton Rouge	445,000	-	Cat. Ck.	155,000	78,000	-	A-K-L-W
				Cat. Rf.	97,000	76,000	-	-
				Hydro.	19,500	17,100	-	-
				Cok.	41,500	10,800	-	-
				Alk.	37,200	31,800	-	-
Good Hope Refineries, Inc.	Good Hope	29,450	-	Cat. Rf.	3,500	3,500	-	-
Gulf Oil Corporation	Belle Chasse	180,400	-	Cat. Ck.	75,700	48,900	-	K
				Cat. Rf.	35,600	28,600	-	-
				Cok.	15,400	3,000	-	-
				Alk.	48,000	27,500	-	-
Do	Venice	28,700	-	Cat. Rf.	17,200	14,600	-	-
				Hydro.	11,200	10,000	-	-
LaJet, Inc.	St. James	11,000	-	-	-	-	-	-
Murphy Oil Corporation	Meraux	92,500	-	Cat. Ck.	18,500	6,800	-	-
				Cat. Rf.	18,000	13,500	-	-
				Alk.	3,300	3,000	-	-
Shell Oil Company	Norco	240,000	-	Cat. Ck.	89,000	53,000	-	A-K
				Cat. Rf.	39,300	32,600	-	-
				Hydro.	25,000	26,000	-	-
				Cok.	17,000	3,500	-	-
				Alk.	14,700	13,000	-	-
Tenneco Oil Company	Chalmette	97,500	-	Cat. Ck.	20,000	11,000	-	K
				Cat. Rf.	33,000	28,000	-	-
				Hydro.	16,000	17,000	-	-
				Cok.	8,600	1,200	-	-
				Alk.	6,000	4,500	-	-
Texaco Inc.	Convent	140,000	-	Cat. Ck.	70,000	39,000	-	-
				Cat. Rf.	30,000	25,000	-	-
				Thml. Ck.	12,000	1,000	-	-
				Alk.	15,000	12,500	-	-
MARYLAND								
Amoco Oil Company	Baltimore	10,000	-	-	-	-	-	A
Chevron Asphalt Company	Baltimore (Fairfield)	-	13,500	-	-	-	-	A
MICHIGAN								
Bay Refining Company, Dow Chemical Company	Bay City	12,000	-	Cat. Ck.	6,000	3,300	-	-
				Alk.	750	-	750	-
Crystal Refining Company	Carsen City	6,200	-	-	-	-	-	-
Lakside Refining Company	Kalamazoo	4,000	-	Cat. Rf.	1,200	1,200	-	-
Merathon Oil Company	Detroit	62,000	-	Cat. Ck.	20,900	13,400	-	A
				Cat. Rf.	15,200	13,500	-	-
				Alk.	4,700	3,500	-	-
Mobil Oil Corporation ⁴	Woodhaven	-	46,600	Cat. Ck.	18,000	-	10,440	K
				Cat. Rf.	10,150	-	7,750	-
				Cok.	3,670	-	800	-
				Alk.	3,800	-	3,200	-
Oscuela Refining Company	West Branch	9,500	-	Cat. Rf.	1,350	1,350	-	-
Patroleum Specialties, Inc.	Flat Rock	-	37,000	-	-	-	-	-
Total Leonard, Inc.	Alma	42,182	-	Cat. Ck.	11,000	7,000	-	A
				Cat. Rf.	13,200	8,500	2,750	-
				Alk.	1,700	1,150	-	-
MINNESOTA								
Continental Oil Company	Wrenshall	23,500	-	Cat. Ck.	6,900	4,400	-	-
				Cat. Rf.	3,600	3,400	-	-
Koch Refining Company	Rosemount	106,990	-	Cat. Ck.	35,200	19,420	-	A-K
				Cat. Rf.	14,160	13,040	-	-
				Cok.	22,560	3,640	-	-
				Alk.	8,340	8,340	-	-
Northwestern Refining Company, a Division of Ashland Oil, Inc.	St. Paul Park	66,000	-	Cat. Ck.	20,000	12,500	-	A
				Cat. Rf.	11,000	9,000	-	-
				Alk.	4,600	3,200	-	-

See footnotes at end of table.

Capacity of petroleum refineries in the United States and
Puerto Rico: January 1, 1974 (Continued)
(Barrels per calendar day)

IV-15

Company	Location	Crude oil distillation		Cracking, reforming, coking, and alkylation				Other products ²	
		Operating	Shutdown	Type of Process ¹	Charge		Gasoline output		
					Operating and Shutdown	Operating	Shutdown		
MISSISSIPPI									
Amerada Hess Corporation, Hess Oil & Chemical Division ⁴	Purvis	28,500	-	Cat. Ck. Cat. Rf. Cok. Alk.	14,500 5,700 6,400 5,290	8,600 4,750 1,600 3,600	- - - -	R	
Southland Oil Company	Lumberton	5,500	-	-	-	-	-	A	
Do	Sandersville	11,000	-	-	-	-	-	A	
Do	Yazoo City	4,500	-	-	-	-	-	A	
Standard Oil Company (Kentucky)	Pascagoula	240,000	-	Cat. Ck. Cat. Rf. Hydro. Alk.	52,000 58,000 53,000 10,600	33,000 48,000 57,000 8,300	- - - -	A	
MISSOURI									
Amoco Oil Company	Sugar Creek	105,000	-	Cat. Ck. Cat. Rf. Cok. Alk.	38,000 14,000 11,000 10,000	21,000 12,500 3,000 5,000	- - - -	A-K	
MONTANA									
Big West Oil Company	Kevin	5,123	-	Cat. Rf. Thml. Ck.	1,000 1,052	888 468	- -	A	
Continental Oil Company	Billings	52,500	-	Cat. Ck. Cat. Rf. Alk.	13,000 12,900 5,200	8,300 10,900 3,350	- - -	A	
Diamond Asphalt Company	Chinook	-	1,000	-	-	-	-	A	
Exxon Company, U.S.A.	Billings	45,000	-	Cat. Ck. Cat. Rf. Hydro. Cok. Alk.	18,200 13,800 4,400 4,700 3,800	10,900 11,700 4,400 850 3,200	- - - - -	A-K	
Farmers Union Central Exchange, Inc.	Laurel	41,650	-	Cat. Ck. Cat. Rf. Alk.	15,000 6,800 3,400	10,300 5,600 3,400	- - -	A	
Jet Fuel Refinery	Nosby	1,000	-	-	-	-	-	-	
John Wight, Inc. ⁴	Shelby	-	1,500	-	-	-	-	-	
Phillips Petroleum Company	Great Falls	5,700	-	Cat. Ck. Cat. Rf.	1,800 600	1,100 550	- -	A	
Tesoro Petroleum Corporation (formerly Spruce Oil Corporation)	Wolf Point	2,500	-	Thml. Ck.	600	-	300	-	
Westco Refining Company	Out Bank	4,658	-	Cat. Rf. Thml. Ck.	950 2,200	760 760	- -	-	
NEBRASKA									
CRA, Inc.	Scottsbluff	5,000	-	Cat. Ck. Cat. Rf.	2,000 1,000	1,270 900	- -	-	
NEVADA									
J. A. Lyddon & Associates (formerly Tonopah Refining Division, Newton Petroleum Enterprises)	Tonopah	-	500	-	-	-	-	-	
NEW JERSEY									
Amerada Hess Corporation, Hess Oil and Chemical Division ⁴	Port Reading (Sewaren)	70,000	-	Cat. Ck. Cat. Rf. Alk.	30,000 6,500 6,300	18,600 5,450 4,480	- - -	-	
Chevron Oil Company	Perth Amboy	88,000	-	Cat. Ck. Cat. Rf. Alk.	28,500 36,000 3,500	14,000 11,000 2,800	- - -	A	
Exxon Company, U.S.A.	Linden	265,000	10,000	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	115,000 40,000 2,000 9,600	68,800 31,800 - 8,000	- - 200 -	A	
Mobil Oil Corporation	Paulsboro	98,000	-	Cat. Ck. Cat. Rf. Cok. Alk.	22,800 21,500 22,100 3,900	10,000 16,100 2,900 2,200	- - - -	R-L-W	
National Oil Recovery Corporation	Bayonne	3,000	-	-	-	-	-	-	
Taxaco Inc.	Westville	88,000	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	40,000 13,000 13,000 3,200	18,000 11,000 1,000 3,000	- - - -	-	
NEW MEXICO									
Caribou-Four Corners Oil Company	Farmington	2,200	-	-	-	-	-	-	
Parasitic Oil and Refining Company	Monument	5,000	-	Cat. Rf.	600	600	-	-	
Navajo Refining Company	Artesia	20,930	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	5,200 1,870 1,250 2,300	3,000 1,665 600 1,300	- - - -	-	
Plateau, Inc.	Bloomfield	5,300	-	Cat. Rf.	2,250	2,000	-	-	
Do ⁴	Farmington	-	1,000	-	-	-	-	-	
Shell Oil Company	Cinisa (Gallup)	20,000	-	Cat. Ck. Cat. Rf. Alk.	6,850 6,500 2,200	3,500 5,500 1,650	- - -	A	
Thriftyway Oil Company ⁴	Bloomfield	4,000	-	-	-	-	-	-	

See footnotes at end of table.

Capacity of petroleum refineries in the United States and
Puerto Rico: January 1, 1974 (Continued)
(Barrels per calendar day)

IV-16

Company	Location	Crude oil distillation		Cracking, reforming, coking, and alkylation				Other products ^a
		Operating	Shutdown	Type of Process ¹	Gasoline output			
					Charge Operating and Shutdown	Operating Shutdown		
NEW YORK								
Ashland Oil, Inc.	North Tonawanda (Buffalo)...	64,000	-	Cat. Ck. Cat. Rf.	20,000 11,000	13,000 9,000	- -	A
Mobil Oil Corporation	Buffalo	42,800	-	Cat. Ck. Cat. Rf. Alk.	17,600 10,500 3,600	9,500 8,000 2,600	- - -	A
NORTH CAROLINA								
Pace Oil Company ⁴	Wilmington	12,000	-	-	-	-	-	-
NORTH DAKOTA								
Amoco Oil Company	Mandan	48,000	-	Cat. Ck. Cat. Rf. Alk.	23,000 8,200 6,400	12,000 7,400 2,900	- - -	-
Westland Oil Company	Williston	5,000	-	Cat. Rf. Thml. Ck.	2,000 1,100	1,600 550	- -	-
OHIO								
East:								
Ashland Oil, Inc.	Canton	64,000	-	Cat. Ck. Cat. Rf. Alk.	22,000 11,000 7,000	14,000 9,000 5,000	- - -	A
West:								
Ashland Oil, Inc.	Findlay	-	20,400	-	-	-	-	A
Gulf Oil Corporation	Cleves (Cincinnati)	42,100	-	Cat. Ck. Cat. Rf. Alk.	17,400 9,500 7,600	11,100 8,500 4,400	- - -	A
Do	Toledo	50,300	-	Cat. Ck. Cat. Rf. Alk.	19,400 10,700 7,800	12,200 9,300 5,300	- - -	A
Standard Oil Company of Ohio	Lima	168,000	-	Cat. Ck. Cat. Rf. Hydro. Cok. Alk.	33,300 44,800 20,200 13,800 600	16,500 36,800 7,300 600	- - - -	A-K-L-W
Do	Toledo	120,000	-	Cat. Ck. Cat. Rf. Hydro. Cok. Alk.	52,300 36,600 32,200 11,400 12,300	27,400 30,800 10,100 800	- - - -	A-K
Sun Oil Company	do	125,000	-	Cat. Ck. Cat. Rf. Hydro. Thml. Rf. Alk.	49,000 40,000 25,000 5,000 11,500	26,000 32,000 22,000 - 7,000	- - - 3,000 -	A
OKLAHOMA								
Allied Materials Corporation	Stroud	5,500	-	-	-	-	-	A-L
APCO Oil Corporation	Cyril	12,035	-	Cat. Ck. Cat. Rf. Alk.	6,000 1,000 2,400	3,600 - 1,400	- 900	A
Champion Petroleum Company	Enid	49,500	-	Cat. Ck. Cat. Rf. Cok. Alk.	19,000 15,000 3,600 2,500	16,500 12,750 600 4,000	- - -	A-K-L-W
Continental Oil Company	Ponca City	117,000	-	Cat. Ck. Cat. Rf. Cok. Thml. Ck. Alk.	41,000 29,400 14,900 12,000 16,600	26,300 25,000 2,800 1,800 9,300	- - - -	A-K-L-W
Kerr-McGee Corporation	Wynnewood	33,500	-	Cat. Ck. Cat. Rf. Hydro. Alk.	11,000 7,000 4,500 3,500	6,000 6,100 4,500 3,500	- - -	A
Midland Cooperative, Inc.	Cushing	19,000	-	Cat. Ck. Cat. Rf. Cok. Alk.	7,000 4,500 4,000 3,100	4,400 3,500 776 2,400	- - -	K
OKC Refining Co., Inc.	Okmulgee	25,000	-	Cat. Ck. Alk.	8,000 1,500	4,800 1,500	- -	A
Sun Oil Company	Duncan	48,500	-	Cat. Ck. Cat. Rf. Cok. Alk.	23,000 7,600 11,000 9,000	12,500 6,300 2,800 6,000	- - -	K
Do	Tulsa	88,500	-	Cat. Ck. Cat. Rf. Cok. Alk.	28,000 30,000 8,000 12,000	15,500 17,000 1,700 8,200	- 5,000	A-K-L-W
Texasco Inc.	do	50,000	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	18,000 8,000 6,000 3,200	10,000 7,000 3,000 3,000	- - -	-
Tonkawa Refining Company	Arnett	2,600	2,400	-	-	-	-	-
Trumbull Asphalt Company ⁴	Oklahoma City	-	1,200	-	-	-	-	A
Vickers Petroleum Corporation	Ardmore	32,500	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	12,500 6,000 2,500 5,700	7,800 5,400 175 4,500	- - -	A

See footnotes at end of table.

Capacity of petroleum refineries in the United States and
Puerto Rico: January 1, 1974 (Continued)
(Barrels per calendar day)

IV-17

Company	Location	Crude oil distillation		Cracking, reforming, coking, and alkylation				Other products ²
		Operating	Shutdown	Type of Process ¹	Gasoline output			
					Operating and Shutdown	Operating			Shutdown
OREGON								
Chevron Asphalt Company	Willbridge (Portland)	-	14,000	-	-	-	-	A
PENNSYLVANIA								
East:								
Atlantic Richfield Company	Philadelphia	185,000	-	Cat. Rf. Hydro.	58,000 28,000	49,000 11,000	-	A
BP Oil Corporation	Marcus Hook	100,000	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	33,300 20,200 11,000 10,600	18,700 17,800 700 8,100	-	-
Gulf Oil Corporation	Philadelphia	168,500	-	Cat. Ck. Cat. Rf.	71,200 49,600	45,200 42,160	-	-
Sun Oil Company	Marcus Hook	165,000	-	Cat. Ck. Cat. Rf. Thml. Rf. Alk.	73,500 46,500 12,000 15,600	40,000 34,000 7,200	-	A-L-W
West:								
Pennzoil Company	Oil City (Rouseville)	10,000	-	Cat. Rf.	4,000	3,400	-	L-W
Pennzoil Company, Wolfe Head Oil Refining Division	Reno	2,100	-	-	-	-	-	L-W
Penreco, a Division of Pennzoil Company	Karns City	-	31,400	-	-	-	-	L
Quaker State Oil Refining Corporation	Emlenton	3,320	-	Cat. Rf. Thml. Ck. Thml. Rf.	1,250 640 425	1,060 - 340	-	L-W
Do	Smethport (Farmers Valley)	6,500	-	Cat. Rf. Thml. Ck.	2,300 1,400	2,300 1,400	-	L-W
United Refining Company	Warren	38,100	-	Cat. Ck. Cat. Rf. Alk.	10,000 8,500 1,700	5,500 7,500 1,400	-	A
Valvoline Oil Company, a Division of Ashland Oil, Inc.	Freedom	6,800	-	-	-	-	-	L-W
Witco Chemical Corporation, Bradford Petroleum Division	Bradford	8,500	-	Cat. Rf.	2,000	1,800	-	L-W
RHODE ISLAND								
Mobil Oil Corporation	East Providence	7,500	-	-	-	-	-	A
TENNESSEE								
Delta Refining Company	Memphis	31,500	-	Cat. Ck. Alk.	11,850 3,550	5,925 3,125	-	A
TEXAS								
Inland:								
Adobe Refining Company, a subsidiary of Crystal Oil Company	La Blanca	5,000	-	-	-	-	-	-
American Petrofina Company of Texas	Mt. Peasant	26,000	-	Cat. Ck. Cat. Rf. Alk.	9,000 3,000 5,400	4,700 2,700 2,100	-	A
Chavron Oil Company, Western Division	El Paso	71,000	-	Cat. Ck. Cat. Rf. Alk.	20,900 31,750 5,400	11,000 19,000 4,800	-	A
Cosden Oil and Chemical Company	Big Spring	65,000	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	23,000 34,000 10,000 7,800	14,000 18,000 6,000 6,000	12,000	A
Diamond Shamrock Corporation	Sunray	48,300	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	21,500 14,000 3,800 8,700	11,500 14,000 1,500 9,000	-	A
Dorchester Gas Producing Company	White Deer	2,000	-	Cat. Rf.	950	1,000	-	-
Flint Chemical Company	San Antonio	1,500	-	-	-	-	-	L
Howell Hydrocarbons	do	3,000	-	Hydro.	1,000	1,000	-	-
J-W Refining Inc. (formerly Anderson Refining Company)	Tucker (Palestine)	10,000	-	-	-	-	-	-
La Gloria Oil and Gas Company	Tyler	28,000	-	Cat. Ck. Cat. Rf. Cok. Thml. Ck. Alk.	12,500 8,500 12,000 3,000 4,500	5,000 6,800 600 1,600 3,200	-	K
Longview Refining Company, a subsidiary of Crystal Oil Company	Longview	7,500	-	Cat. Rf. Thml. Ck.	1,500 2,500	1,500 -	2,500	-
Petrolite Corporation, Baraco Wax Division	Kilgore	1,000	-	-	-	-	-	A-W
Phillips Petroleum Company	Borger	95,000	-	Cat. Ck. Cat. Rf. Alk.	55,000 26,000 16,000	30,000 22,000 14,500	-	-
Pride Refining, Inc.	Abilene	15,000	-	-	-	-	-	-
Shell Oil Company	Odessa	32,000	-	Cat. Ck. Cat. Rf. Alk.	9,900 9,400 3,500	4,500 8,100 2,650	-	-
Tesoro Petroleum Corporation	Carrizo Springs	13,000	-	-	-	-	-	-
Texaco Inc.	Amarillo	20,000	-	Cat. Ck. Cat. Rf. Cok. Alk.	8,000 5,000 4,000 1,600	4,000 4,000 1,000 1,500	-	K
Do	El Paso	17,000	-	Cat. Ck. Cat. Rf. Cok. Alk.	7,000 3,500 4,000 1,700	4,000 3,000 1,000 1,500	-	K

See footnotes at end of table.

Capacity of petroleum refineries in the United States and
Puerto Rico: January 1, 1974 (Continued)
(Barrels per calendar day)

IV-18

Company	Location	Crude oil distillation		Cracking, reforming, coking, and alkylation				Other products ²	
		Operating	Shutdown	Type of Process ¹	Charge		Gasoline output		
					Operating and Shutdown	Operating	Shutdown		
TEXAS (Cont.)									
Inland: (Cont.)									
Texas Asphalt and Refining Company ⁴	Eules	4,000	-	-	-	-	-	-	
Texas Fuel and Asphalt Company	La Costa	1,500	-	-	-	-	-	A	
Three Rivers Refinery, Inc., a Division of Signor Corporation	Three Rivers	-	³ 1,500	-	-	-	-	A-L	
Winston Refining Company, McLean Trucking Company (formerly Fort Worth Refining Company)	Fort Worth	15,000	-	Cat. Ck. Cat. Rf.	3,400 1,700	2,550	- 1,700	-	
Wood County Refining Company	Quitman	-	3,000	-	-	-	-	A	
Gulf:									
American Petrofina Company of Texas (formerly BP Oil Corporation)	Port Arthur	84,000	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	28,000 22,000 10,000 3,200	13,000 12,600 1,000 2,700	- ³ 7,200 -	-	
Amoco Oil Company	Texas City	333,000	-	Cat. Ck. Cat. Rf. Hydro. Cok. Alk.	128,500 129,000 38,000 22,500 31,000	71,000 93,500 36,000 4,500 26,700	-	A-K	
Atlantic Richfield Company	Houston	213,000	-	Cat. Ck. Cat. Rf. Cok. Thml. Ck.	65,000 96,000 30,000 15,000	37,000 83,500 6,000	-	A-K-L-W	
Champlin Petroleum Company	Corpus Christi	62,186	-	Cat. Ck. Cat. Rf. Alk.	9,500 26,000 3,400	6,000 23,400 2,700	-	³ 3,000	
Charter International Oil Company	Houston	70,000	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	24,000 13,100 10,000 6,500	13,500 12,200 2,100 4,300	-	A	
Coastal States Petrochemical Company	Corpus Christi	135,000	-	Cat. Ck. Cat. Rf. Cok. Alk.	19,500 35,000 10,000 3,500	11,000 31,000 2,500 2,500	-	A-K	
Crown Central Petroleum Corporation	Pasadena	100,000	-	Cat. Ck. Cat. Rf. Cok. Alk.	43,000 22,000 9,500 15,000	26,000 18,000 1,600 10,000	-	K	
Eddy Refining Company	Houston	2,160	-	-	-	-	-	-	
Exxon Company, U.S.A.	Baytown	400,000	-	Cat. Ck. Cat. Rf. Hydro. Alk.	122,000 84,000 19,000 30,000	55,000 67,000 20,700 25,000	-	A-L-W	
Gulf Oil Corporation	Port Arthur	312,100	-	Cat. Ck. Cat. Rf. Hydro. Cok. Alk.	117,700 63,100 14,300 28,800 34,600	72,400 52,300 16,650 6,000 19,300	-	E-L-W	
Marathon Oil Company	Texas City	61,000	-	Cat. Ck. Cat. Rf.	27,700 7,500	17,100 7,100	-	-	
Mobil Oil Corporation	Beaumont	335,000	-	Cat. Ck. Cat. Rf. Hydro. Cok. Alk.	130,000 84,000 21,700 31,400 19,000	48,000 69,000 23,900 4,400 16,000	- ³ 15,000	K-L-W	
Monsanto Chemical Company ⁴	Alvin	8,500	-	-	-	-	-	-	
Phillips Petroleum Company	Sweeny	85,000	-	Cat. Ck. Cat. Rf. Alk.	30,000 32,000 10,000	18,000 30,000 9,000	-	-	
Quintana Howell Joint Venture (formerly Howell Refining Company)	Corpus Christi	12,500	-	-	-	-	-	-	
Saber Petroleum Corporation	do	-	9,000	-	-	-	-	-	
Shell Oil Company	Dear Park (Houston)	294,000	-	Cat. Ck. Cat. Rf. Hydro. Thml. Ck. Alk.	65,000 72,500 22,500 80,500 10,500	33,000 48,500 17,000 13,300 7,500	-	A-L-W	
South Hampton Company	Silsbee	5,600	-	Cat. Rf.	3,500	1,320	-	-	
Southwestern Oil and Refining Company	Corpus Christi	105,000	-	Cat. Ck. Cat. Rf. Alk.	12,200 17,000 5,740	6,100 13,900 3,400	-	-	
Sun Oil Company	do	57,000	-	Cat. Ck. Cat. Rf. Cok. Alk.	18,000 22,400 6,600 4,600	10,800 14,600 1,300 3,100	-	K	
Texaco Inc.	Port Arthur	406,000	-	Cat. Ck. Cat. Rf. Hydro. Thml. Ck. Alk.	135,000 60,000 15,000 51,000 17,000	70,000 50,000 7,500 22,000 15,000	-	L-W	
do	Port Neches	47,000	-	-	-	-	-	-	
Texas City Refining, Inc.	Texas City	60,000	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	18,350 11,000 4,500 5,300	9,500 9,300 225 3,300	-	A	
Union Oil Company of California	Nederland	116,000	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	32,200 35,200 11,100 4,050	17,500 29,600 -	- 1,350	A-L-W	
Union Texas Petroleum, a Division of Allied Chemical Corporation	Winnie	9,400	-	Cat. Rf. Hydro.	5,600 2,700	4,700 2,700	-	-	

See footnotes at end of table.

Capacity of petroleum refineries in the United States and
Puerto Rico: January 1, 1974 (Continued)
(Barrels per calendar day)

IV-19

Company	Location	Crude oil distillation		Cracking, reforming, coking, and alkylation				Other products ²	
		Operating	Shutdown	Type of Process ¹	Charge		Gasoline output		
					Operating and Shutdown	Operating	Shutdown		
UTAH									
Amoco Oil Company	Salt Lake City	39,000	-	Cat. Ck. Cat. Rf. Alk.	17,000 5,500 4,200	10,200 5,000 3,750	- - -	A	
Caribou-Four Corners Oil Company	Woods Cross	5,000	-	Cat. Rf. Hydro.	2,000 1,000	1,800 1,000	- -	-	
Chevron Oil Company, Western Division	Salt Lake City	45,000	-	Cat. Ck. Cat. Rf. Cok. Alk.	16,000 5,000 7,000 5,500	8,000 4,400 1,500 3,500	- - - -	K	
Crown Refining Company	Woods Cross	1,000	-	-	-	-	-	-	
Husky Oil Company	North Salt Lake	11,500	-	Cat. Ck. Cat. Rf. Alk.	4,000 900 1,200	2,700 800 750	- - -	-	
Major Oil Corporation	Roosevelt	5,000	-	-	-	-	-	-	
Morrison Petroleum Company	Woods Cross	1,500	-	-	-	-	-	-	
Phillips Petroleum Company	.....do.	23,000	-	Cat. Ck. Cat. Rf. Alk.	8,000 4,500 1,800	6,000 3,400 1,600	- - -	A
VIRGINIA									
Amoco Oil Company	Yorktown (Goodwin Neck)	53,000	-	Cat. Ck. Cat. Rf. Cok.	26,500 8,000 14,000	13,900 6,350 850	- - -	K	
WASHINGTON									
Atlantic Richfield Company	Ferndale	96,000	-	Cat. Rf. Hydro. Cok.	33,250 33,250 27,550	28,600 26,950 5,700	- - -	K	
Chevron Asphalt Company	Seattle (Richmond Beach)	-	4,500	-	-	-	-	A	
Mobil Oil Corporation	Ferndale	71,500	-	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	25,500 20,900 7,000 10,000	12,720 8,500 100 5,000	- 9,300 - -	-	
Shell Oil Company	Anacortes	91,000	-	Cat. Ck. Cat. Rf. Alk.	34,000 19,000 12,600	22,000 16,000 11,300	- - -	-	
Sound Refining, Inc.	Tacoma	4,500	-	-	-	-	-	A-L	
Texaco Inc.	Anacortes	63,000	-	Cat. Ck. Cat. Rf. Alk.	29,000 8,000 3,300	13,000 6,300 3,000	- - -	-	
U. S. Oil and Refining Company	Tacoma	16,000	-	Cat. Rf.	2,300	2,500	-	A	
WEST VIRGINIA									
Pennzoil Company, Elk Refining Division	Felling Rock	4,200	-	Cat. Rf.	2,000	1,660	-	L-W	
Quaker State Oil Refining Corporation	St. Marys (Ohio Valley)	5,000	-	Cat. Rf.	1,300	1,150	-	L-W	
Do	Newell	9,700	-	Cat. Rf.	2,600	2,500	-	L-W	
WISCONSIN									
Empire International, Inc.	Sheboygan	-	5,000	-	-	-	-	A	
Murphy Oil Corporation	Superior	37,000	-	Cat. Ck. Cat. Rf. Alk.	9,500 8,000 1,400	6,000 6,000 1,300	- - -	A	
WYOMING									
Amoco Oil Company	Casper	43,000	-	Cat. Ck. Cat. Rf. Alk.	9,500 5,200 2,250	5,800 4,650 1,150	- - -	A-L-W	
Ashland Oil, Inc. ⁴	Thermopolis	450	35,000	-	-	-	-	A	
C & H Refinery, Inc.	Lusk	24,200	-	Cat. Ck. Cat. Rf. Alk.	9,500 5,900 4,000	5,850 5,300 2,600	- - -	A	
Husky Oil Company	Cheyenne	10,800	-	Cat. Ck. Cat. Rf. Alk.	3,100 1,050 1,200	1,800 1,000 700	- - -	A	
Do	Cody	16,800	5,200	Cat. Ck. Cat. Rf.	6,500 3,750	4,500 3,200	- -	A	
Little America Refining Company	Casper	390	-	-	-	-	-	-	
Mountaineer Refining Company, Inc.	La Barge	150	-	-	-	-	-	-	
Oriental Refining Company (formerly Gordon Refining Company)	Greybull	40,000	-	Cat. Ck. Cat. Rf. Alk.	12,000 9,700 7,400	6,600 8,600 2,200	- - -	A	
Pasco, Inc.	Sinclair	1,200	-	-	-	-	-	-	
Sage Creek Refining Company, Inc. ⁴	Cowley	600	-	-	-	-	-	-	
Southwestern Refining Company	La Barge	10,500	-	Cat. Ck. Alk.	3,750 1,200	2,500 800	- -	-	
Tesoro Petroleum Corporation	Newcastle	21,000	-	Cat. Ck. Cat. Rf. Cok.	7,000 4,000 4,000	4,000 3,400 2,000	- - -	K	
Texaco Inc.	Casper	-	-	-	-	-	-	-	
HAWAIIAN FOREIGN TRADE ZONE									
Hawaiian Independent Refinery, Inc. ⁶	Ewa Beach	40,389	-	-	-	-	-	-	

See footnotes at the end of table.

Capacity of petroleum refineries in the United States and
Puerto Rico: January 1, 1974 (Continued)
(Barrels per calendar day)

IV-20

Company	Location	Crude oil distillation		Cracking, reforming, coking, and alkylation				Other products ²	
		Operating	Shutdown	Type of Process ¹	Charge		Gasoline output		
					Operating and Shutdown	Operating	Shutdown		
PUERTO RICO									
Caribbean Gulf Refining Corporation	Bayamón	37,800	-	Cat. Ck. Cat. Rf.	7,800 5,500	4,300 4,500	- -	A	
Commonwealth Oil Refining Company, Inc.	Pamuelas	110,000	51,000	Cat. Ck. Cat. Rf. Thml. Ck. Alk.	36,000 3,500 20,000 5,500	20,000 - 2,000 4,000	- 32,950 - 1,500	-	
Phillips Puerto Rico Core, Inc. ⁵	Guayama	-	-	Cat. Rf.	15,000	12,000	-	L	
Sun Oil Company	Yabucoa	85,000	-	-	-	-	-	L	

Note: The statistics in the Bureau of Mines Monthly Petroleum Statement cover the refining operations of the plants in the United States listed in this table in addition to the operations of the following plants which do not process crude oil.

Company	Location	Type of Process/Plant
Chevron Asphalt Company	Mobile (Blakely Island), Alabama	Asphalt processing
Do	Cincinnati, Ohio	Asphalt processing
Cit-Con Oil Corporation	Lake Charles, Louisiana	Lube and wax
Petrolite Corp., Bareco Wax Div.	Barnsdall, Oklahoma	Wax
Standard Oil Company of Ohio	Cleveland, Ohio	Asphalt processing
Union Oil Co. of California	Anchorage, Alaska	Asphalt processing
Do	Portland, Oregon	Asphalt processing
Do	Edmonds, Washington	Asphalt processing
Do	Petrolia, Pennsylvania	Wax
Witco Chemical Corporation		

¹Type of process:

Cat. Ck. Catalytic cracking
Cat. Rf. Catalytic reforming
Hydro. Hydrocracking

Cok. Coking
Thml. Ck. Thermal cracking
Thml. Rf. Thermal reforming
Alk. Alkylation

²Other products: A - Asphalt; K - Coke; L - Lubricants; W - Wax
³Equipment considered inoperable without extensive reconditioning.

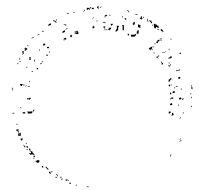
⁴Capacities estimated.

⁵Not counted as a refinery because it does not process crude oil.

⁶Not included with refineries in the United States because it is located in a Foreign Trade Zone.

⁷Includes crude oil. See Table 3.

Source: Interior (5)



SOURCES

- (1) FACTS ABOUT OIL, 1974, American Petroleum Institute.
- (2) FACTORS AFFECTING U.S. PETROLEUM REFINING - A SUMMARY, May 1973, National Petroleum Council.
- (3) REFINING AND FACILITIES BRANCH, Office of Oil and Gas, Office of Energy Resources and Development, FEA, December 1974.
- (4) ORGANIC CHEMISTRY, 1971, Norman L. Allinger, et al.
- (5) MINERAL INDUSTRY SURVEY, July 1974, Bureau of Mines, U.S. Department of the Interior.
- (6) PROJECT INDEPENDENCE REPORT, November 1974, FEA.
- (7) COMPLIANCE AUDIT AND REVIEW DIVISION, Office of Compliance and Enforcement, Office of Operations, Regulations, and Compliance, FEA, December 1974.
- (8) TESTIMONY BEFORE SENATE COMMITTEE ON INTERIOR AND INSULAR AFFAIRS, May 29, 1974, John C. Sawhill.
- (9) OFFICE OF ENERGY STATISTICS, December 1974, Office of Policy and Analysis, FEA.