

Gasoline Marketing in the United States Today

API PUBLICATION 1593
THIRD EDITION, MAY 1992

American Petroleum Institute
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Manufacturing, Distribution and Marketing Department

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I. INTRODUCTION

Motor fuel, and especially gasoline, is essential to the American economy. Gasoline prices are among the most scrutinized prices in motorists' budgets. Yet knowledge of gasoline marketing and prices is limited. This booklet provides an overview of gasoline markets, including prices and their components, taxes, employment, and numbers of retail outlets. It also describes the participants, facilities, and institutions that comprise the gasoline business. Finally, it is a basic data book for gasoline marketing.

II. MOTOR FUEL CONSUMPTION

Approximately one-fourth of world oil consumption occurs in the U.S., and over two-thirds of U.S. oil use is for transportation. More than one-half of U.S. oil consumption is motor fuel. Indeed, U.S. gasoline consumption exceeds the oil consumption of any other industrialized nation.

Motor gasolines represent about 80 percent of total U.S. motor fuel consumption, as indicated in Figure II-1. Most of the remaining motor fuel comprises diesel fuel, the preferred choice for large motor vehicles due to the greater fuel economy of diesel engines. Today the dominant motor gasoline is unleaded regular, which displaced leaded regular as the leading fuel in the 1980s.

The leading states in motor fuel use are California and Texas. Just six states--Californ-

ia, Florida, Georgia, Illinois, New York, and Texas--accounted for half of the growth in motor fuel consumption over the past decade. Figures II-2 and II-3 show that Florida experienced the greatest growth, moving from sixth to third place in state motor fuel consumption. Ohio, however, fell from fourth to sixth in motor fuel consumption, despite an increase of about 39 million gallons between 1980 and 1990 (Tables 2-1 and 2-2).

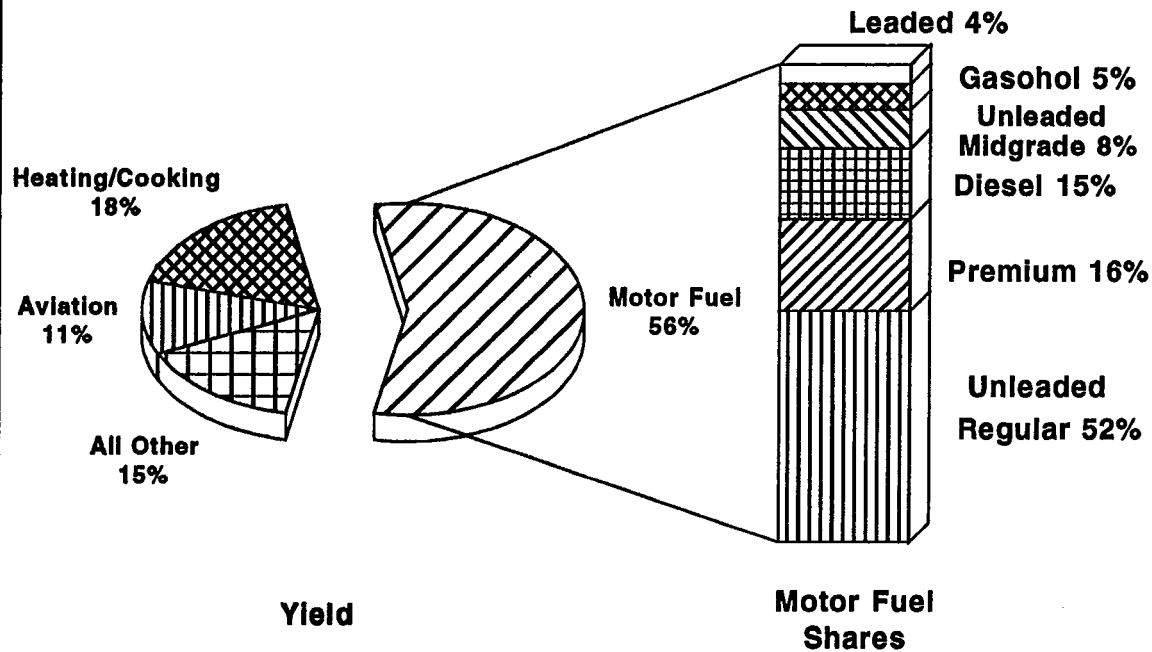
Ohio and Illinois consume large amounts of gasohol, a gasoline-ethanol blend. Gasohol accounts for about 20 percent of motor fuel consumption in Ohio and Illinois, compared to about 5 percent nationwide (Table 2-2). Overall, consumption of gasohol increased fifteenfold during 1980-90.



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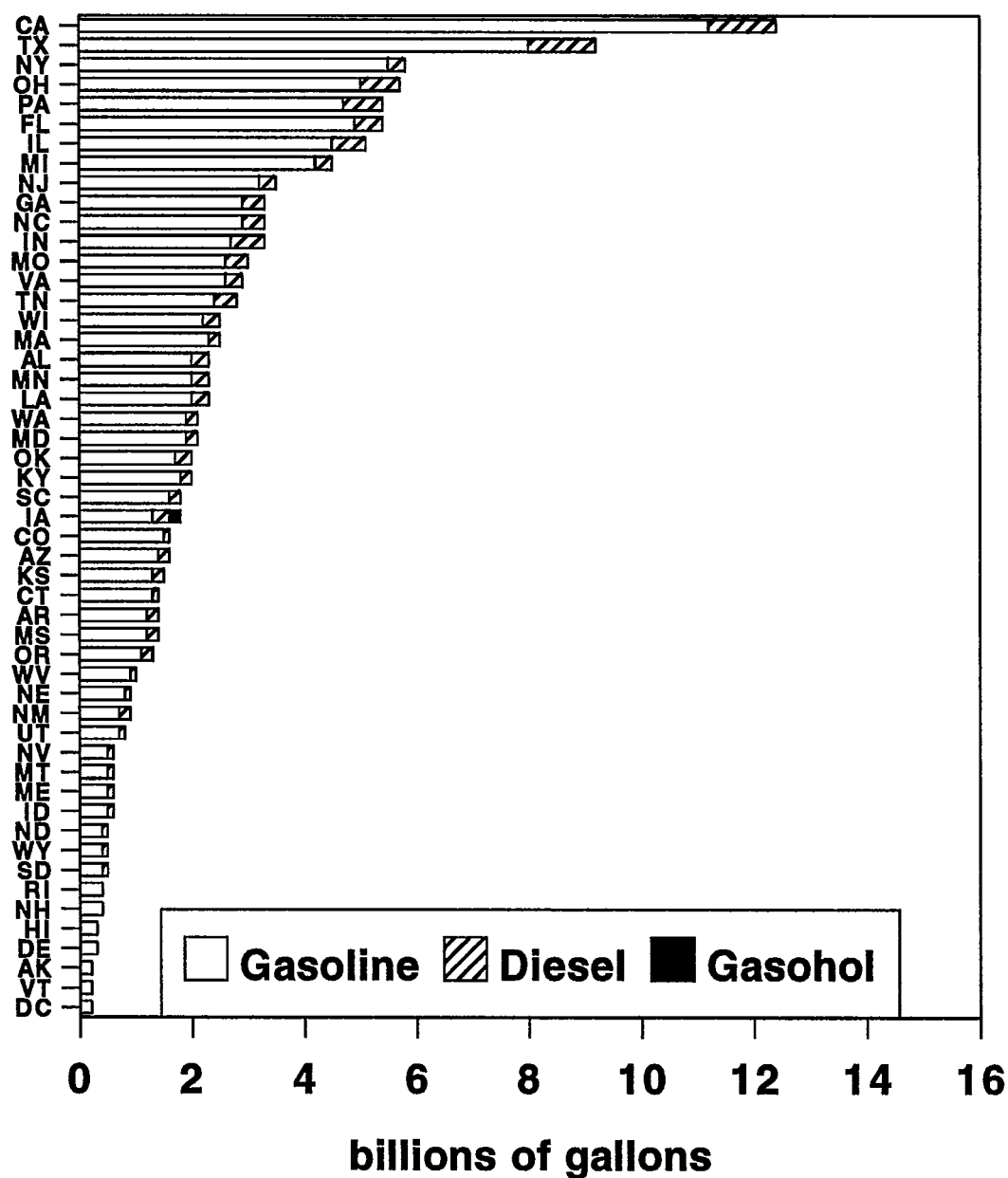
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**Figure II-1: Yield From a Barrel of Oil
and Relative Shares of Motor Fuel
Consumption, 1990**



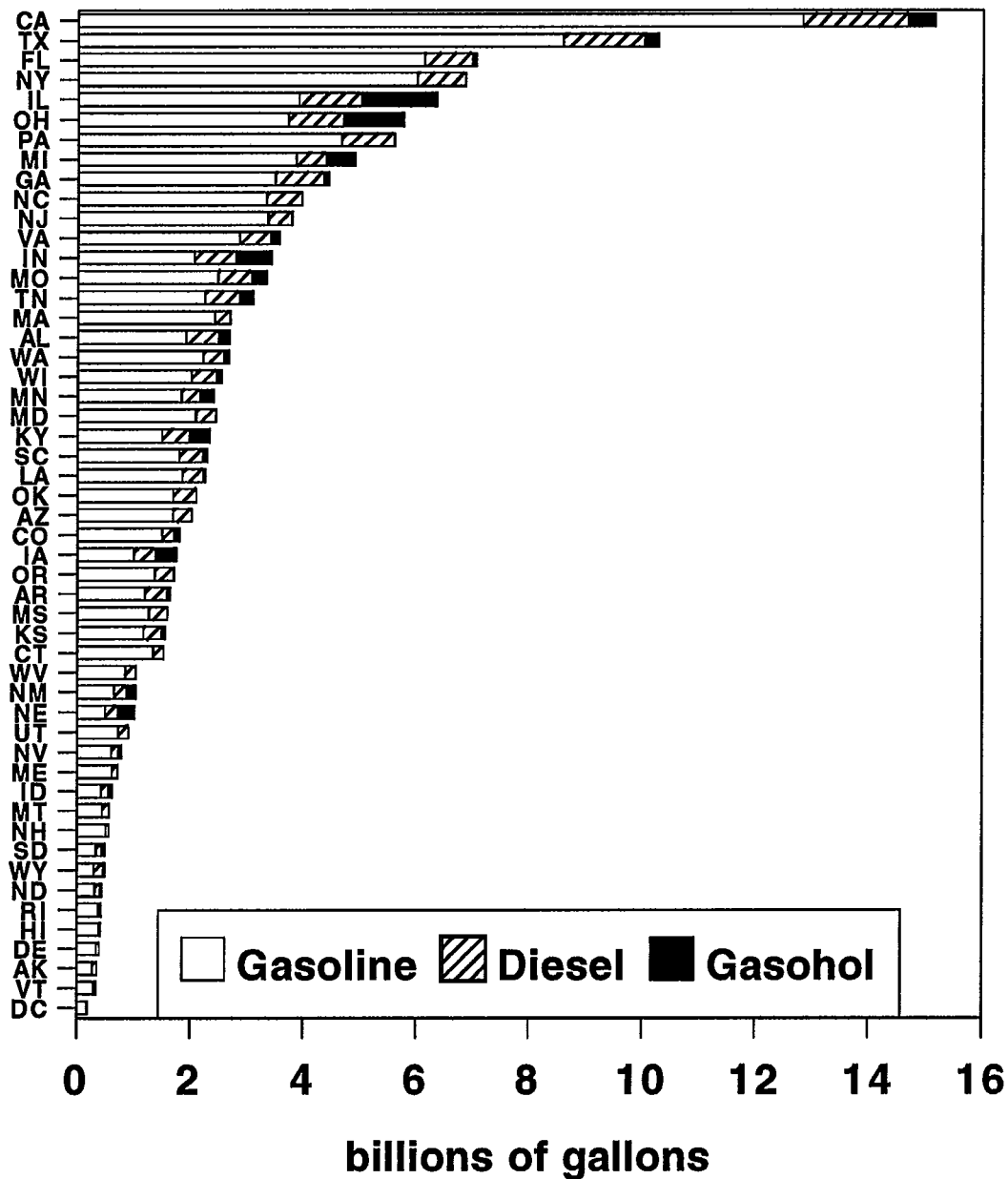
Source: DOE/EIA and Federal Highway Administration

Figure II-2
Motor Fuel Use by State, 1980



Source: Federal Highway Administration

Figure II-3 Motor Fuel Use by State, 1990



Source: Federal Highway Administration

TABLE 2-1: MOTOR FUEL CONSUMPTION BY STATE, 1980
(thousands of gallons)

State	Gasoline ^a	Special Fuels ^b	Gasohol ^c	Total ^d
Alabama	1,927,862	322,457	0	2,291,673
Alaska	176,508	46,132	0	217,986
Arizona	1,335,734	218,807	2,798	1,574,133
Arkansas	1,158,380	213,762	8,250	1,381,608
California	11,005,095	1,153,621	0	12,366,420
Colorado	1,495,944	141,087	3	1,620,720
Connecticut	1,313,106	104,213	15,849	1,414,690
Delaware	287,189	35,156	1,512	327,360
D.C.	168,308	17,293	124	169,045
Florida	4,782,182	498,560	14,359	5,445,006
Georgia	2,852,361	449,287	11,063	3,386,756
Hawaii	320,053	19,169	1,095	334,988
Idaho	485,977	55,085	0	535,022
Illinois	4,734,077	604,245	15,088	5,128,791
Indiana	2,619,601	577,215	0	3,247,318
Iowa	1,541,419	268,905	155,947	1,687,675
Kansas	1,290,742	232,972	37,786	1,556,303
Kentucky	1,731,216	247,928	4,763	2,023,850
Louisiana	2,053,329	288,967	0	2,324,312
Maine	513,146	57,474	2,634	579,803
Maryland	1,912,745	165,740	18,549	2,124,779
Massachusetts	2,239,015	185,113	16,209	2,471,139
Michigan	4,224,371	304,285	29,924	4,539,735
Minnesota	2,010,927	252,877	11,776	2,304,715
Mississippi	1,168,545	212,544	0	1,418,224
Missouri	2,563,018	359,091	0	2,988,253
Montana	457,299	98,615	158	570,076
Nebraska	835,791	145,923	30,067	1,008,003
Nevada	493,628	78,064	0	575,486
New Hampshire	408,329	27,956	3,642	427,045
New Jersey	3,157,473	340,076	6,567	3,578,999
New Mexico	738,984	167,771	0	904,586
New York	5,537,492	332,853	0	5,797,567
North Carolina	2,879,089	382,817	10,688	3,308,621
North Dakota	399,800	79,070	13,491	489,256
Ohio	4,924,878	707,286	16,726	5,722,020
Oklahoma	1,729,969	305,944	28,910	2,040,935
Oregon	1,332,274	243,414	0	1,369,326
Pennsylvania	4,691,130	705,190	0	5,422,835
Rhode Island	374,377	27,187	1,763	408,127
South Carolina	1,545,179	228,847	11,608	1,816,842
South Dakota	423,548	73,557	10,507	498,947
Tennessee	2,392,632	383,751	0	2,815,891
Texas	7,890,182	1,199,933	0	9,247,206
Utah	678,501	111,133	0	791,656
Vermont	236,677	29,771	0	241,926
Virginia	2,566,496	318,037	0	2,896,420
Washington	1,861,717	235,020	14,063	2,120,351
West Virginia	843,208	123,976	692	979,943
Wisconsin	2,155,685	304,702	0	2,511,462
Wyoming	372,469	93,962	611	464,738
TOTAL U.S.	104,837,657	13,776,840	497,222	119,468,570

^aExcludes losses allowed for evaporation, handling, etc. Includes gasohol figures shown in this table.

^bRepresents gross gallons of special fuels (primarily diesel fuel with small amounts of liquified petroleum gas) reported by the state motor fuel tax agencies.

^cRepresents gross gallons of gasohol (ethanol blends) reported by the states. In states where gasohol is taxed at the same rate as gasoline, some gasohol gallonage may be commingled with gasoline data.

^dTotal excludes exports and military use, but includes 854,073 thousand gallons of gasoline losses allowed for evaporation and handling.

Source: Federal Highway Administration, "Highway Statistics, 1985," Tables MF-221, MF-224T, MF-225, MF-226, and MF-233GLA.

TABLE 2-2: MOTOR FUEL CONSUMPTION BY STATE, 1990
(thousands of gallons)

State	Gasoline ^a	Special Fuels ^b	Gasohol ^c	Total ^d
Alabama	2,114,554	571,091	197,856	2,687,978
Alaska	270,832	83,524	0	354,816
Arizona	1,694,334	331,071	0	2,025,405
Arkansas	1,248,553	385,802	62,004	1,646,990
California	13,166,741	1,852,610	479,716	15,152,394
Colorado	1,531,789	206,215	97,263	1,753,477
Connecticut	1,339,193	186,197	0	1,531,217
Delaware	346,730	53,266	0	400,047
D.C.	173,390	22,818	0	196,046
Florida	6,137,213	843,849	77,558	7,043,054
Georgia	3,573,671	867,436	88,672	4,439,053
Hawaii	382,770	25,795	0	412,308
Idaho	492,689	128,235	70,199	625,901
Illinois	5,200,780	1,095,000	1,341,148	6,348,313
Indiana	2,668,046	726,926	638,337	3,421,936
Iowa	1,362,766	375,714	374,897	1,752,245
Kansas	1,233,131	314,068	73,971	1,559,689
Kentucky	1,847,847	489,652	355,987	2,337,499
Louisiana	1,889,888	374,598	38,760	2,265,007
Maine	608,301	111,379	0	722,258
Maryland	2,036,369	354,729	0	2,445,934
Massachusetts	2,406,598	262,051	0	2,692,978
Michigan	4,293,491	534,548	510,447	4,901,888
Minnesota	2,056,804	334,510	244,336	2,412,090
Mississippi	1,252,411	328,349	0	1,593,411
Missouri	2,749,492	594,302	267,408	3,345,821
Montana	447,364	125,346	1,423	572,710
Nebraska	794,588	220,284	300,632	1,015,605
Nevada	645,271	132,136	49,167	783,955
New Hampshire	505,919	51,759	0	561,188
New Jersey	3,364,597	422,486	0	3,787,083
New Mexico	803,095	222,638	156,935	1,033,847
New York	5,971,939	859,646	0	6,856,604
North Carolina	3,333,266	627,675	0	3,964,316
North Dakota	350,707	93,125	35,821	443,832
Ohio	4,747,902	964,868	1,072,040	5,760,729
Oklahoma	1,695,341	412,127	0	2,107,468
Oregon	1,365,524	338,950	0	1,704,474
Pennsylvania	4,614,575	931,630	0	5,593,428
Rhode Island	377,590	40,827	0	420,421
South Carolina	1,859,473	422,625	62,549	2,287,383
South Dakota	389,115	100,902	60,000	493,973
Tennessee	2,494,386	607,875	246,713	3,102,261
Texas	8,842,370	1,426,255	247,384	10,268,653
Utah	721,491	180,927	485	909,706
Vermont	287,733	41,851	0	332,490
Virginia	3,018,984	544,963	161,202	3,564,325
Washington	2,305,401	363,028	86,847	2,674,159
West Virginia	843,858	192,826	0	1,038,415
Wisconsin	2,097,141	443,696	82,961	2,540,837
Wyoming	306,112	176,724	9,513	482,836
TOTAL U.S.	114,262,125	21,398,904	7,492,231	136,368,453

^aExcludes losses allowed for evaporation, handling, etc. Includes gasohol figures shown in this table.

^bRepresents gross gallons of special fuels (primarily diesel fuel with small amounts of liquified petroleum gas) reported by the state motor fuel tax agencies.

^cRepresents gross gallons of gasohol (ethanol blends) reported by the states. In states where gasohol is taxed at the same rate as gasoline, some gasohol gallonage may be commingled with gasoline data.

^dTotal excludes exports and military use, but includes 707,424 thousand gallons of gasoline losses allowed for evaporation and handling.

Source: Federal Highway Administration, "Highway Statistics, 1990," Tables MF-21A, MF-25, MF-33GLA, and MF-21.

III. GASOLINE CONSUMPTION

Gasoline consumption rose steadily during 1962-72 and then erratically during 1973-78. The peak consumption attained in 1978 was almost equalled 11 years later, but still has not been surpassed (Figure III-1).

Gasoline consumption is seasonal, tending to peak in summer and reach bottom in winter. (Figure III-2). Demand also tends to be greater in periods of rising incomes.

Unleaded regular gasoline has become the dominant fuel of choice over the last decade, accounting for about 65 percent of all motor gasoline consumption by 1990. Midgrade and premium unleaded fuels have supplanted leaded fuels. Since leaded regular commonly had an octane rating of 89 (the same as midgrade unleaded), the average octane of motor gasolines has been roughly constant. During 1985-90, unleaded midgrade became a significant fuel of choice in many states east of the Mississippi River.

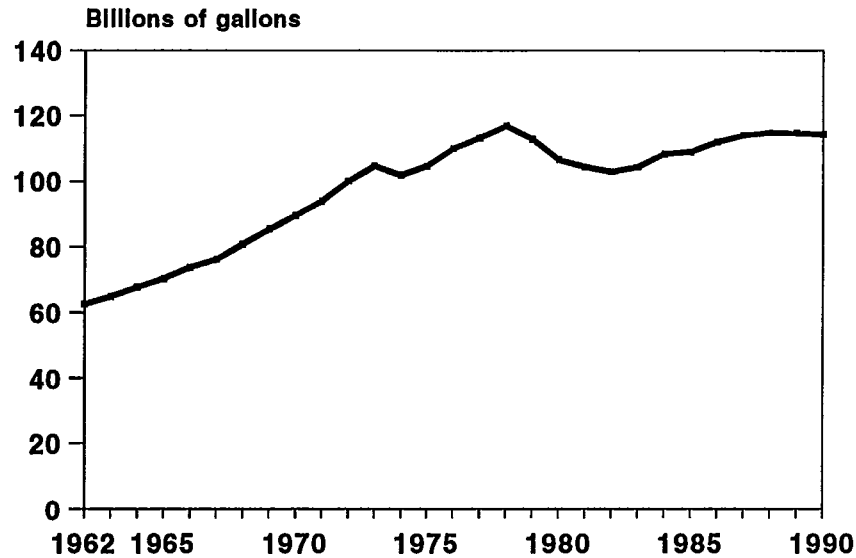
Relative use of gasoline grades varies by area, with leaded regular still significant in the Rocky Mountain states and premium sales highest on the East Coast. Variability in use of unleaded regular is much smaller (Figure III-3). State-by-state consumption of unleaded gasolines for selected years is displayed in Figures III-4 through III-6.

Figure III-7 shows the decline of leaded gasolines from their position of dominance in 1975. In 1980 leaded regular still was the dominant grade of gasoline. Today the U.S. is a world leader in consumption of unleaded fuels.

Self service dispensing became popular in the 1970s as most states repealed prohibitions of self service (Figure III-8). Today self service accounts for about 85 percent of sales (Figure III-9).

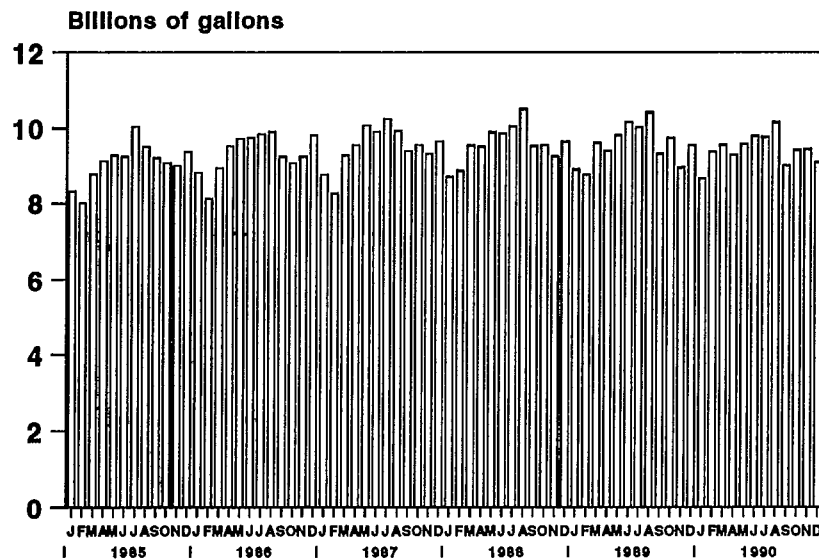


**Figure III-1: Motor Gasoline Consumption,
1962-1990**



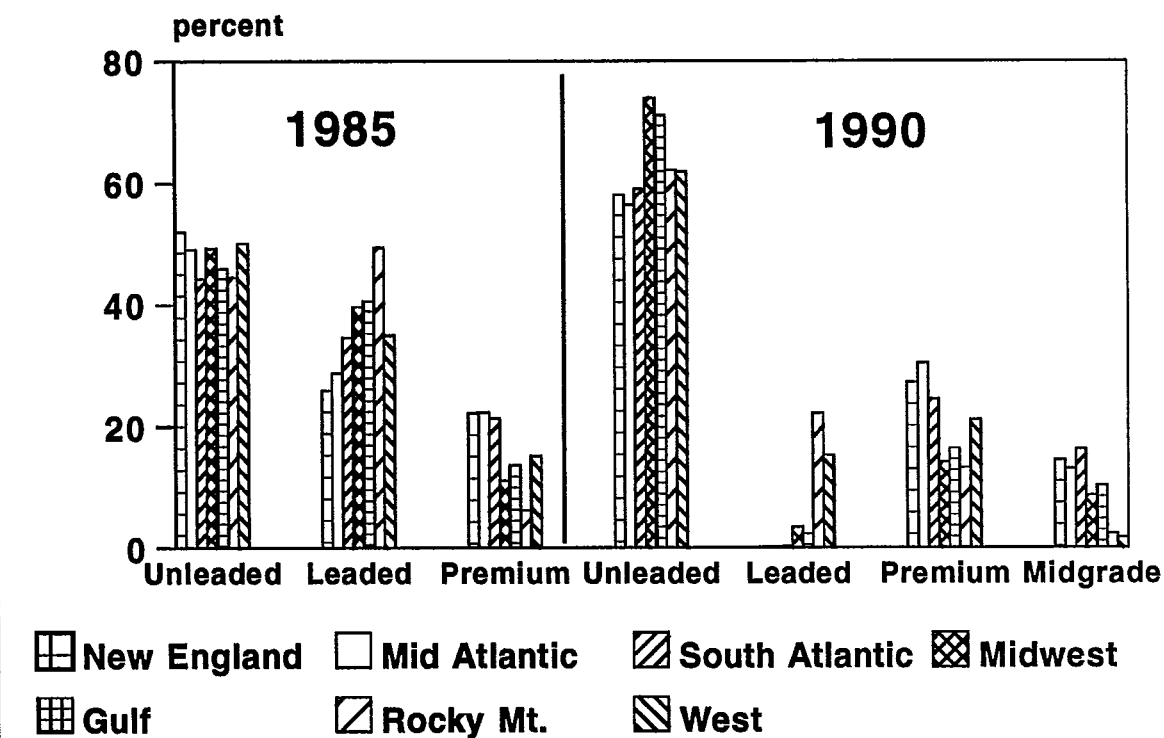
Source: Federal Highway Administration

**Figure III-2: Monthly Gasoline Consumption,
January 1985-December 1990**



Source: Federal Highway Administration

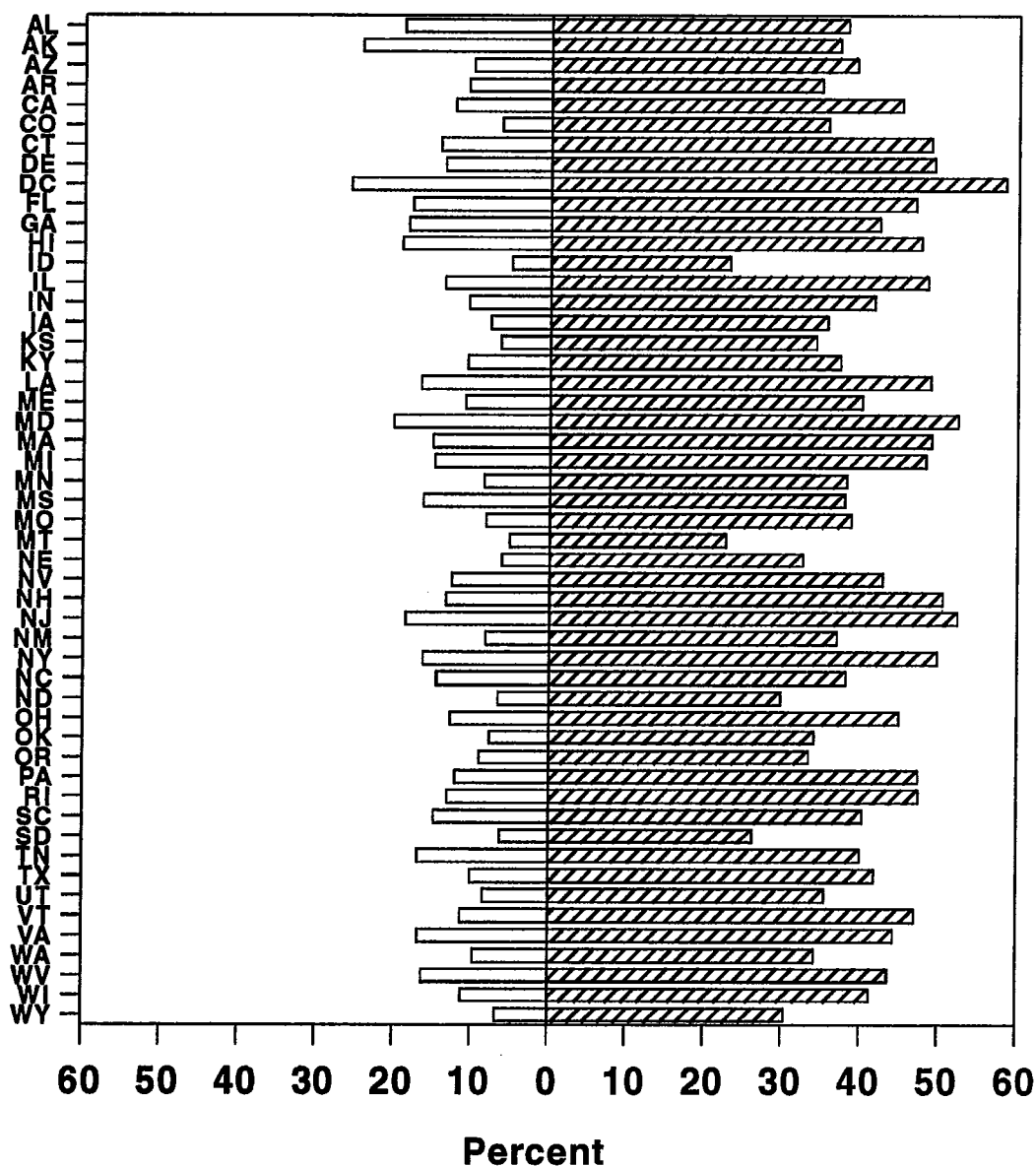
**Figure III-3: Regional Motor Gasoline
Grade Shares, 1985 and 1990**



Source: DOE, "Petroleum Marketing Annual 1990."

Figure III-4 Unleaded Gasoline Use by State

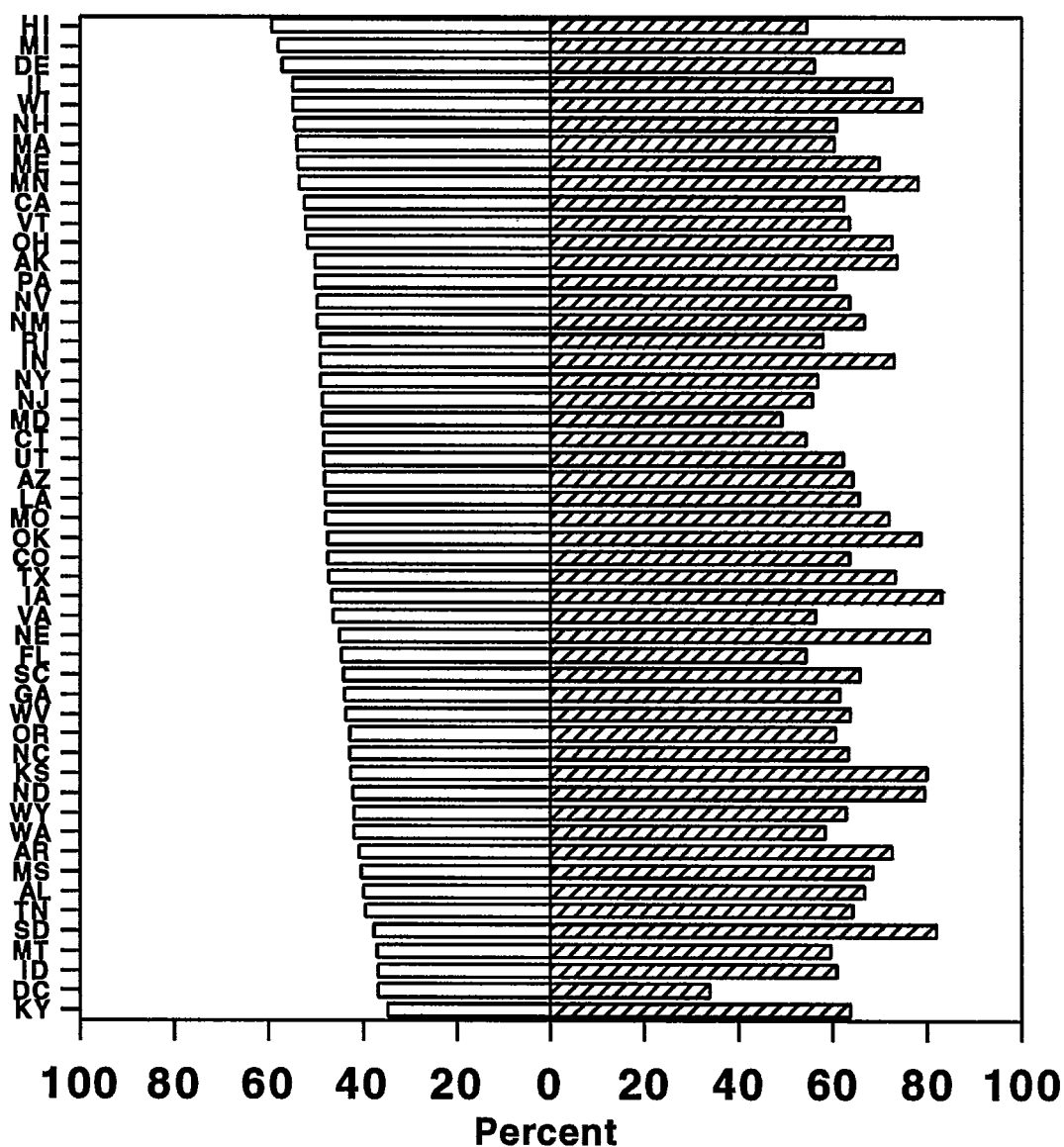
□ 1975 ▨ 1980



Source: Ethyl Corporation

**Figure III-5:
Unleaded Regular Gasoline Use by State**

□ 1985 ▨ 1990



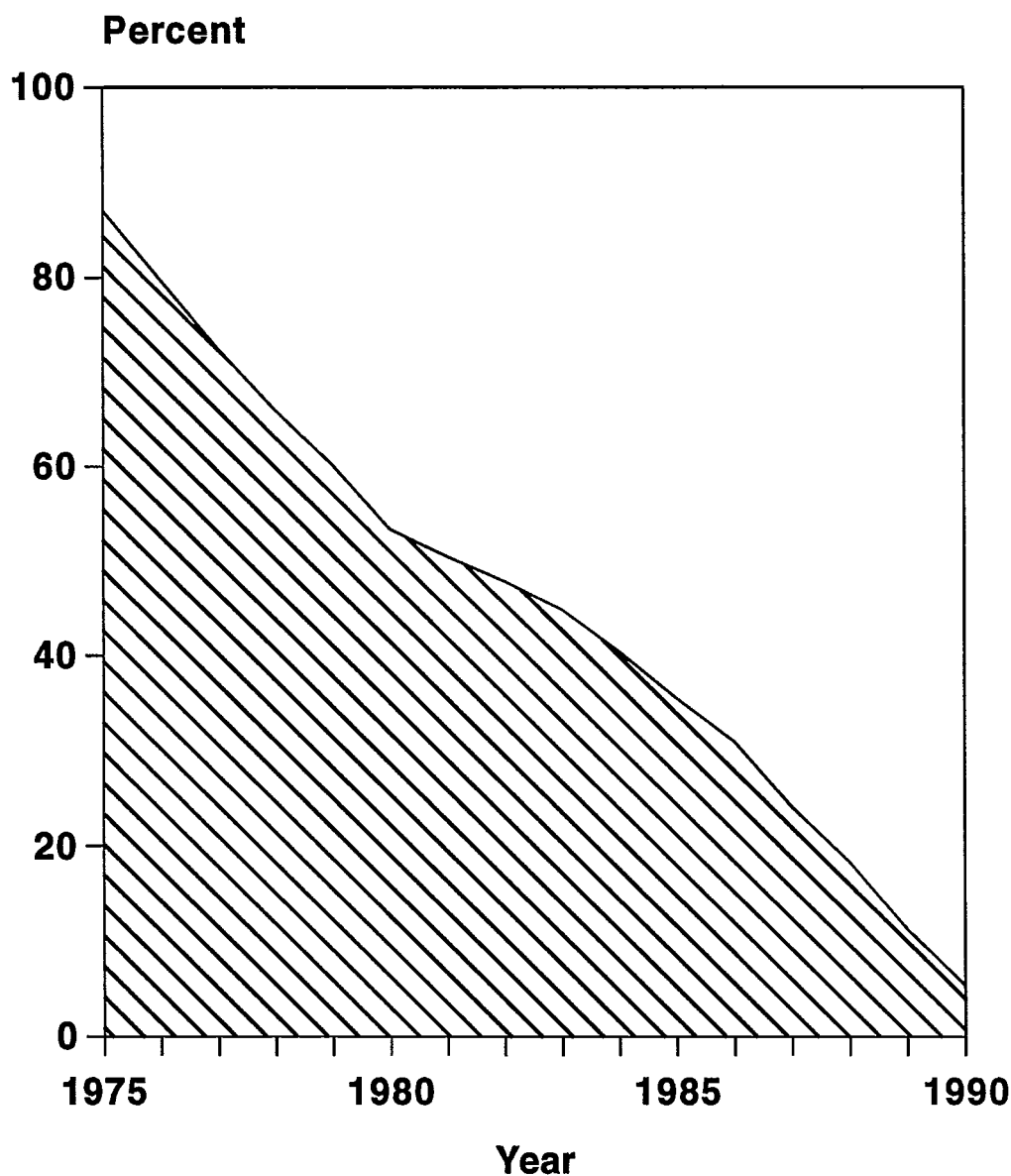
Source: DOE, "Petroleum Marketing Annual."

 1985  1990

Source: DOE, "Petroleum Marketing Annual."

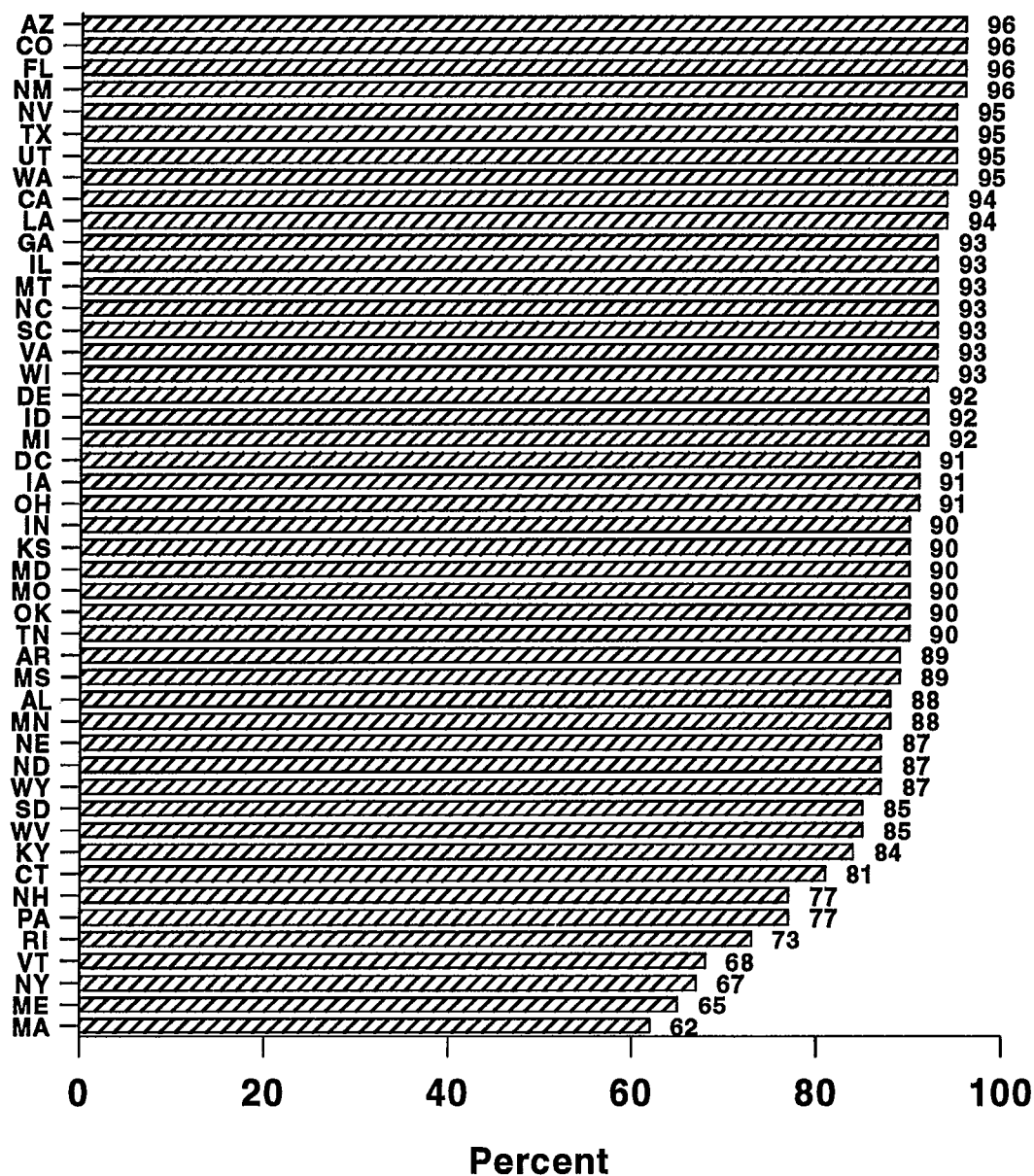
Figure III-7: Consumption of Leaded and Unleaded Motor Gasoline, 1975-1990

▨ Leaded □ Unleaded



Sources: Ethyl Corporation and Department of Energy

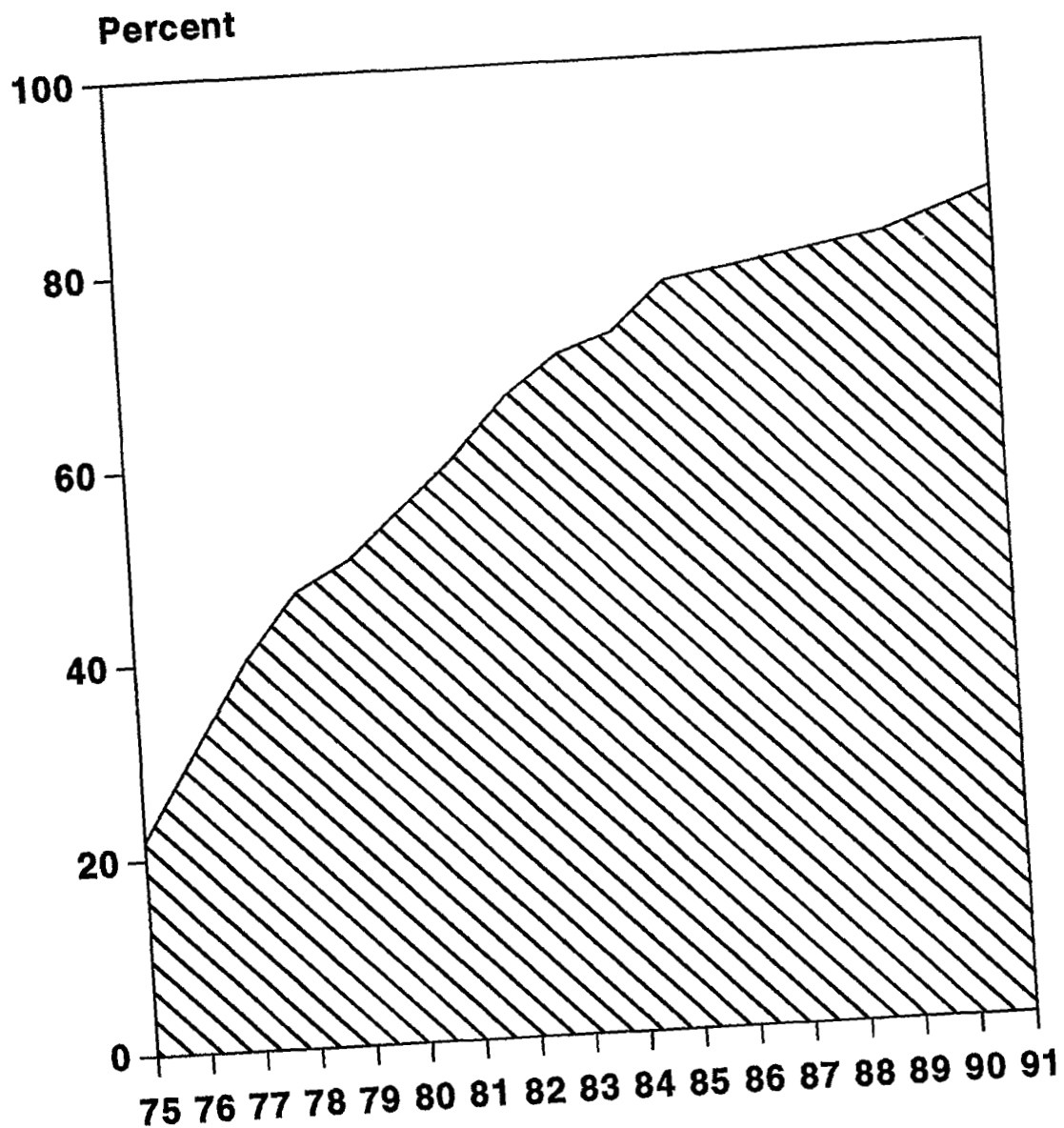
**Figure III-8: Self Service Motorist
Gasoline Market Share By State,* 1991**



*For states within the continental U.S., except Oregon and New Jersey which ban self-serve.
Source: Amoco Corporation, January 1992

Figure III-9: Self Service Motorist Gasoline Market Share, 1977-1991

▨ Self-Serve □ Full-Serve



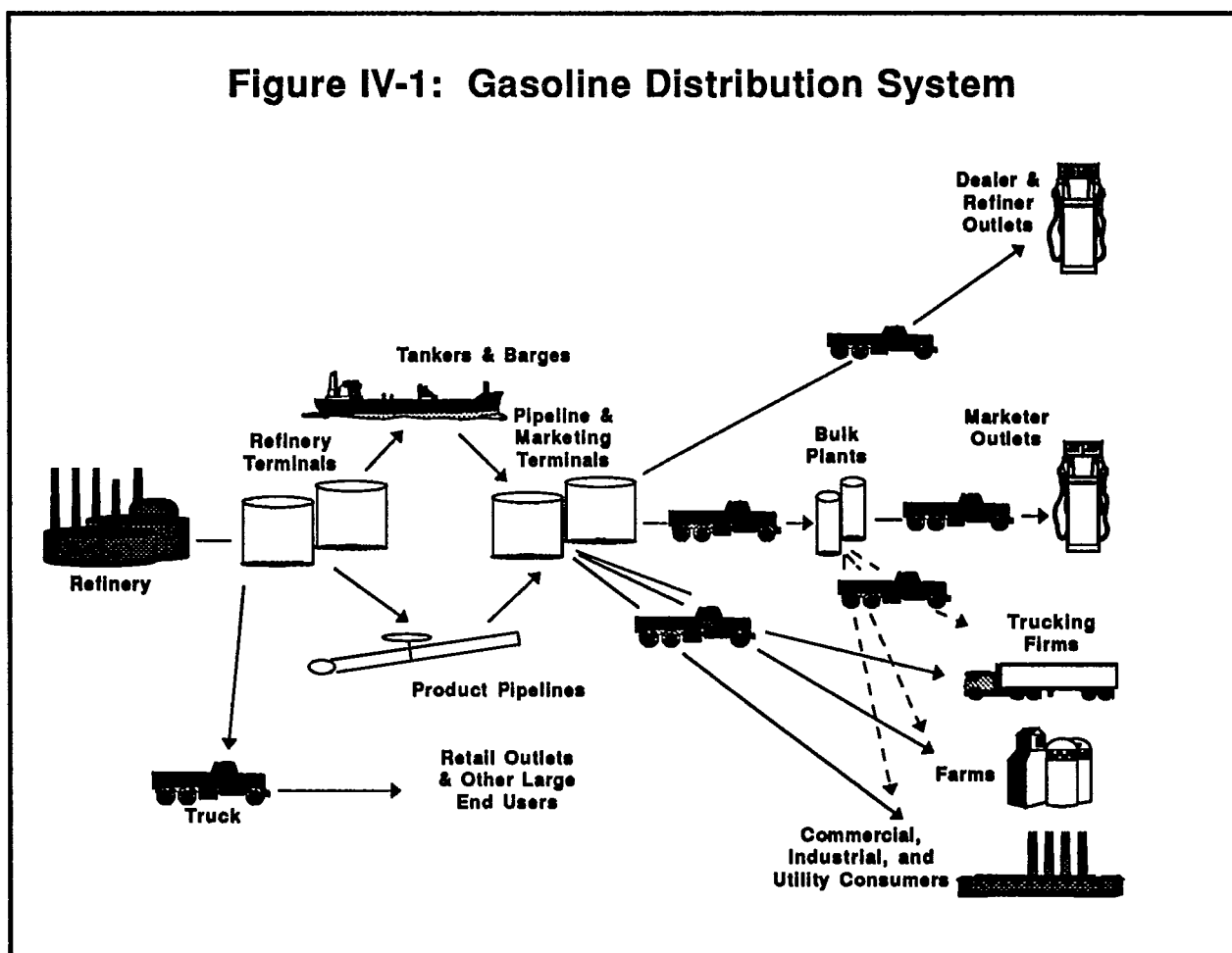
Source: National Petroleum News Factbook, various issues

IV. THE U.S. MOTOR FUEL DISTRIBUTION SYSTEM CONFIGURATION AND GEOGRAPHY

A motorist refilling his tank on an interstate highway probably has travelled a shorter distance than the gasoline he is purchasing. That gasoline likely was manufactured at a refining center hundreds or thousands of miles from the retail outlet, and transported by vessel or pipeline to terminals. Finally, it probably moved by tanker to the outlet's tanks.

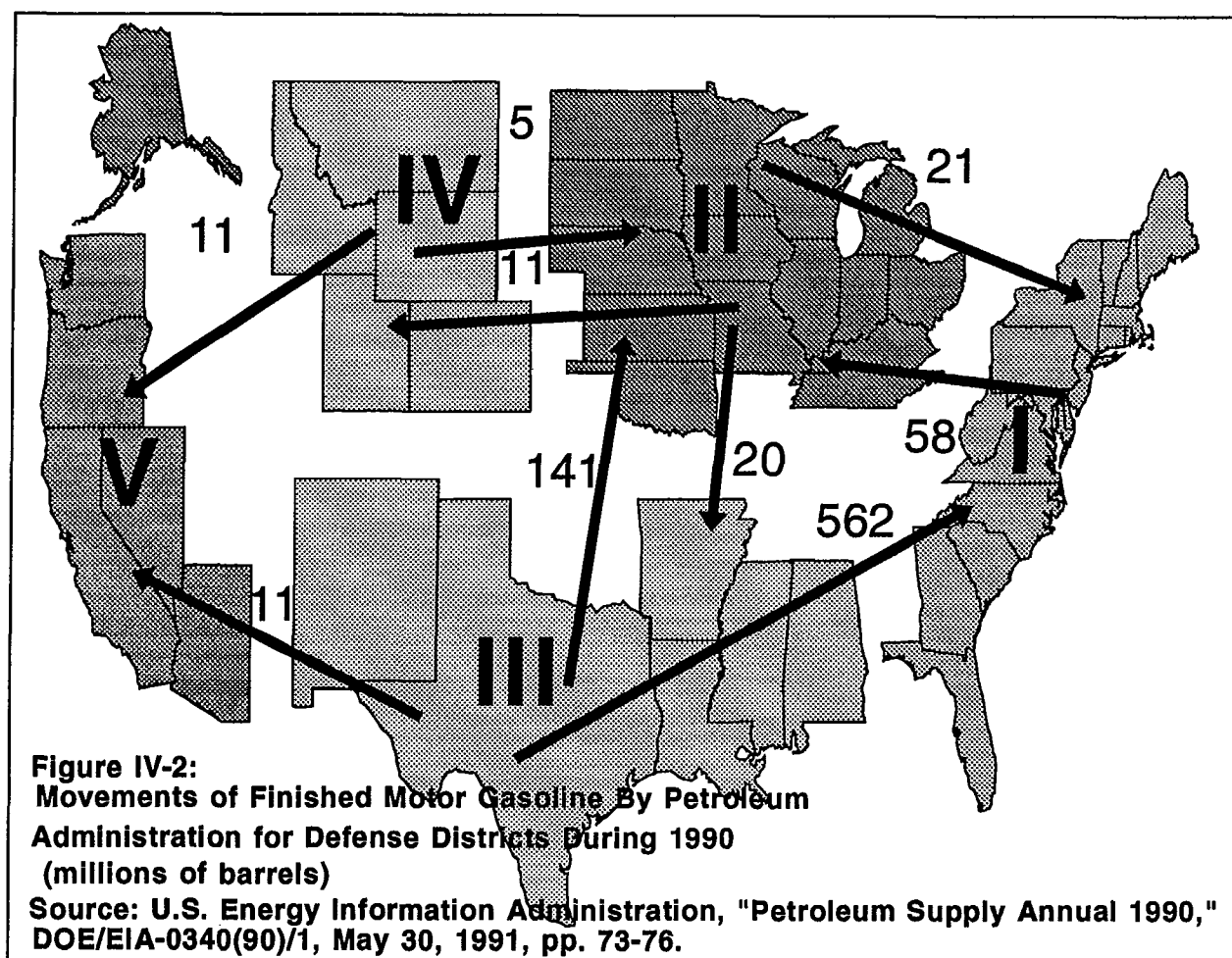
The pictorial overview of the gasoline distribution system in Figure IV-1 underscores the prominent roles of storage and transportation. Each day the millions of barrels of gasoline manufactured and stored at refineries are successively broken down into smaller volume lots of each stage, fanning out to common carriers (e.g., pipelines), terminal operators, marketers, and dealers.

Figure IV-1: Gasoline Distribution System



Annual movements of gasoline among major regions (East Coast, Gulf Coast, Midwest, Rocky Mountains, West Coast) are shown in Figure IV-2. The arrows and associated numbers indicate direction and volumes. For example, 562 million barrels (24 billion gallons) of gasoline were

shipped from Gulf Coast refineries to East Coast markets. The Midwest is the most connected region, receiving most supplies from its own refineries and supplementing these with purchases from the East, Gulf Coast, and Rockies. The West is the least connected.

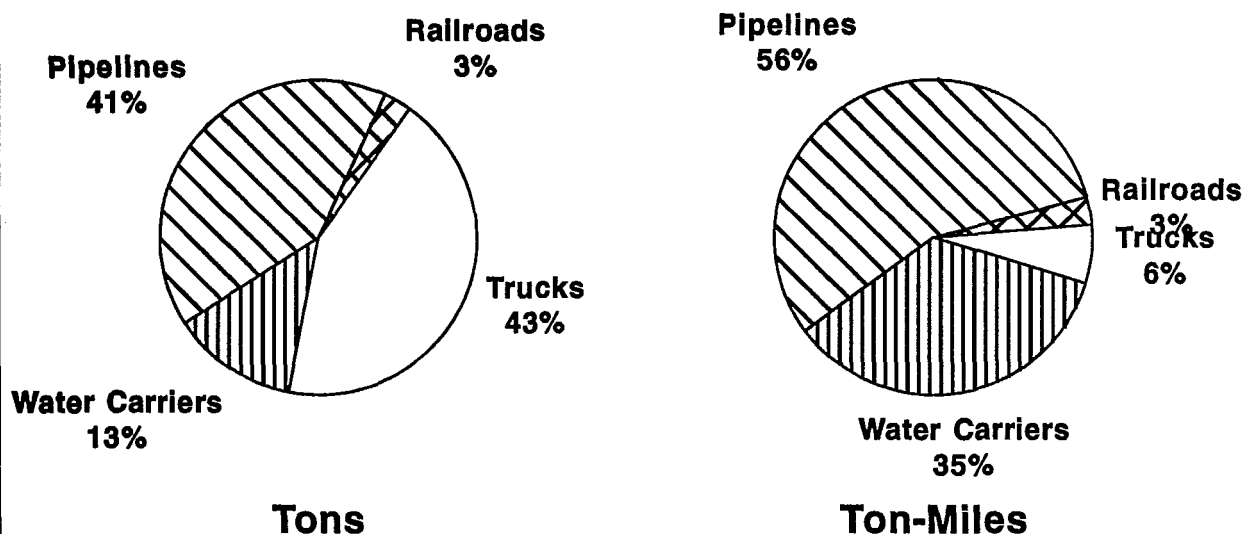


Pipelines and trucks are the most important transport modes (Figure IV-3). Pipelines account for over one-half of ton-miles, meaning that they carry more tons more miles than any other mode. (Eight barrels of gasoline weigh about one ton.) Trucks are relatively dominant in terms of tonnage because they are the key mode between terminals and retail outlets. Pipelines are the least cost, least flexible (in respect to origin and destination), and slowest mode. Trucks are the highest cost,

most flexible, and fastest mode. Water carriers and railroads usually are intermediate in all three respects.

The final stages of gasoline's journey are the movements from major metropolitan area marketing terminals to rural terminals (historically called bulk plants) and outlets, predominantly gasoline service stations, typically by tank truck. The last stage of distribution is that which most distinguishes gasoline from other fuels' distribution.

Figure IV-3: Relative Shares of Petroleum Products Transported by Mode, 1990



Source: Eno Foundation, "Transportation in America," 1991

Retail gasoline outlets are ubiquitous, in keeping with the wide dispersion of gasoline-powered cars and trucks. In contrast, vehicles requiring diesel and other fuels tend to be concentrated in fleets. Therefore, diesel fuel is predominantly dispensed at noncommercial outlets and travel stops catering to large trucks, whose gallonage sales tend to be several times greater than those of retail gasoline outlets. Even so, roughly one-fifth of motor fuel outlets offer diesel or other fuels.¹ This roughly corresponds to the proportion of motor fuel consumption that is not gasoline.

Improvements in cars' and trucks' performance have contributed to fewer full

service stations and more larger volume motor fuel outlets which operate longer hours. Today's cars require less frequent maintenance and refueling stops than those of the 1950s and 1960s when many full service stations were constructed. The larger driveways and greater number of pumps at today's stations permit rapid self service for many motorists simultaneously, thus limiting congestion. The recent increase in 24 hour operation has further enabled consumers' convenience to be served with fewer stations. This transition has resulted in lower prices, due to storage and transportation cost savings, with no loss in convenience.

