

Comparisons of Independent Petroleum Supply Statistics

by Robert G. Harper, III

Introduction

The Petroleum Division (PD) of the Energy Information Administration (EIA) collects and publishes information on petroleum supply and disposition in the United States. The information is collected through a series of surveys that make up the Petroleum Supply Reporting System (PSRS). The PSRS data are published in the *Weekly Petroleum Status Report (WPSR)*, *Petroleum Supply Monthly (PSM)*, and the *Petroleum Supply Annual (PSA)*.

This article compares final petroleum data published in the *PSA* with similar petroleum data obtained from other sources. Data comparisons are presented for 1993 through 2002 for the following series: crude oil production, crude oil imports, motor gasoline supplied, distillate fuel oil supplied, and residual fuel oil supplied. Graphs were added in order to better portray the data similarities and data differences.

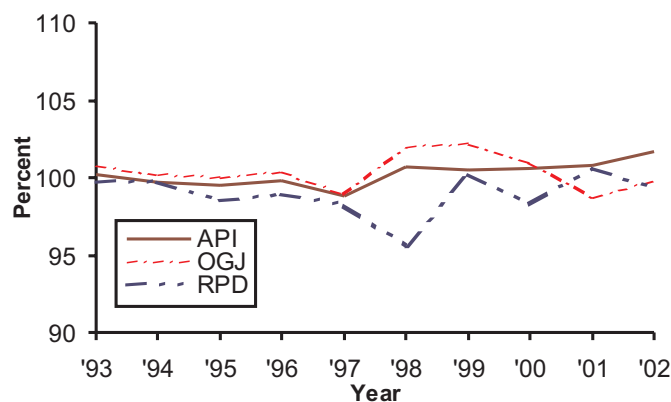
Crude Oil Production

Crude oil production statistics (including those for lease condensate) from the American Petroleum Institute (API), the *Oil and Gas Journal (OGJ)*, and EIA's Reserves and Production Division (RPD) are compared with statistics from the *Petroleum Supply Annual (PSA)* (Table FE1/Figure FE1). Data on crude oil

production published in the *PSA* are based on data collected by State government agencies, as well as the Minerals Management Service (MMS) of the U.S. Department of the Interior, which collects data on crude oil produced on Federally-owned offshore leases.

Production estimates from API are also based on data provided by State government agencies. From 1993 through 2002, API crude

Figure FE1. A Comparison of Crude Oil Production, 1993-2002 (As a Percent of PSA)



Source: Energy Information Administration, *Petroleum Supply Annual*, Table FE1.

Table FE1. A Comparison of Data Series for Crude Oil Production, 1993-2002

Year	PSA	API		OGJ		RPD	
	Million Barrels	Million Barrels	Percent of PSA	Million Barrels	Percent of PSA	Million Barrels	Percent of PSA
2002	2,097	2,132	101.7	2,093	99.8	2,082	99.3
2001	2,117	2,135	100.8	2,089	98.7	2,130	100.6
2000	2,125	2,137	100.6	2,146	101.0	2,088	98.3
1999	2,147	2,152	100.5	2,195	102.2	2,151	100.2
1998	2,282	2,298	100.7	2,327	102.0	2,181	95.6
1997	2,355	2,326	98.8	2,330	98.9	2,312	98.2
1996	2,360	2,356	99.8	2,370	100.4	2,335	98.9
1995	2,394	2,382	99.5	2,393	100.0	2,358	98.5
1994	2,432	2,424	99.7	2,438	100.2	2,425	99.7
1993	2,499	2,504	100.2	2,520	100.8	2,492	99.7

Sources: PSA: *Petroleum Supply Annual*, 1993 through 2002, Table 2. API: American Petroleum Institute, *Monthly Statistical Report*, 1993 through 2002. OGJ: *Oil and Gas Journal*, 1993 through 2002. NGD: *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves Annual Report*, Crude Oil, 1993 through 2002, Table 6. Lease Condensate, 1993 through 2002, Table 15.

oil production statistics had an average absolute difference that was within 0.66 percent of the *PSA* volumes. From 2001 to 2002, the API data difference increased from 0.8 percent above *PSA* numbers to 1.7 percent above *PSA* statistics.

Crude oil production estimates developed by the *Oil and Gas Journal* (OGJ) are based on data obtained from State conservation agencies and on historical State production levels. In 2001, OGJ statistics were 1.3 percent below *PSA* statistics, but, in 2002, the difference declined to 0.2 percent. For the 10-year period 1993 through 2002, the average absolute difference was 0.9 percent.

The RPD publishes the *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves Annual Report*. These crude oil production estimates are based on data from Form EIA-23, "Annual Survey of Domestic Oil and Gas Reserves." In 2002, data were received from a sample survey of 1,577 oil and gas well operators. The RPD's national production estimates for the 2002 data were 0.7 percent lower than comparable *PSA* volumes versus 0.6 percent higher than 2001 *PSA* volumes. However, over the 10-year period 1993 through 2002, the RPD and *PSA* statistics have remained in relatively close agreement, with an average absolute difference of only 1.3 percent.

The comparison of these data series does not show any major discrepancies between the four independent sources. However, minor differences could be due to revisions and late reporting by State agencies, the Minerals Management Service, and also by oil and gas well operators, which do not provide resubmissions.

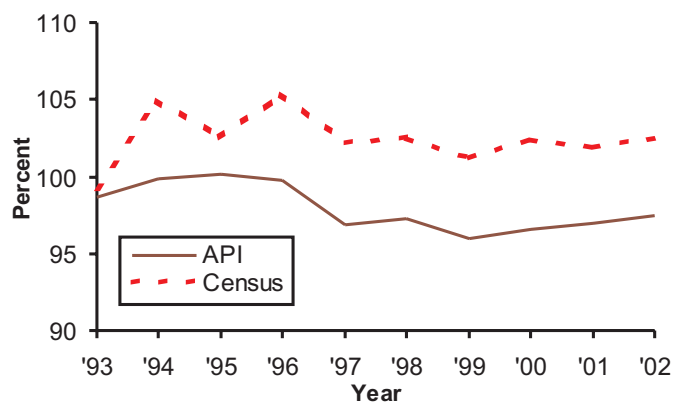
Crude Oil Imports

Data on crude oil imports are collected on survey Form EIA-814, "Monthly Imports Report." Survey respondents to the form include all companies that import crude oil or petroleum products into the United States, Puerto Rico, the Virgin Islands, and other

U.S. possessions. However, for comparison purposes, statistics on imports into Puerto Rico, the Virgin Islands, and other U.S. possessions are excluded from this analysis. Approximately 169 respondents report on the Form EIA-814. The *PSA* statistics are compared with API and the U.S. Bureau of the Census (Census) statistics on crude oil imports (Table FE2/Figure FE2).

Since the API data on crude oil imports does not include crude oil imported by the Strategic Petroleum Reserve (SPR), data from the *PSA* on volumes of crude oil imported for the SPR were added to API data for comparison purposes. (See "Information on Data Source Differences and Adjustments," located on page xxxii). In 2001, there was a 3.0 percent difference between API and *PSA* statistics; however, in 2002, the difference had decreased to 2.5 percent. Over the 10-year period 1993 through 2002, the average absolute difference was 2.1 percent.

Figure FE2. A Comparison of Crude Oil Imports, 1993-2002 (As a Percent of PSA)



Source: Energy Information Administration, *Petroleum Supply Annual*, Table FE2.

Table FE2. A Comparison of Data Series for Crude Oil Imports into United States (Excluding U.S. Possessions), 1993-2002

Year	PSA		API ^a		Census ^b	
	Million Barrels	Million Barrels	Million Barrels	Percent of PSA	Million Barrels	Percent of PSA
2002	3,336	3,252	3,252	97.5	3,418	102.5
2001	3,405	3,302	3,302	97.0	3,471	101.9
2000	3,320	3,208	3,208	96.6	3,399	102.4
1999	3,187	3,058	3,058	96.0	3,224	101.2
1998	3,178	3,092	3,092	97.3	3,258	102.5
1997	3,002	2,909	2,909	96.9	3,069	102.2
1996	2,748	2,743	2,743	99.8	2,894	105.3
1995	2,639	2,642	2,642	100.1	2,705	102.5
1994	2,578	2,576	2,576	99.9	2,704	104.9
1993	2,477	2,445	2,445	98.7	2,459	99.3

^aAPI statistics include PSA statistics for crude oil imported for the Strategic Petroleum Reserve.

^bCensus statistics are adjusted to reflect the geographic coverage and reporting period of the PSA.

Sources: PSA: *Petroleum Supply Annual*, 1993 through 2002, Table 2. API: American Petroleum Institute, *Monthly Statistical Report*, 1993 through 2002. Census: Bureau of the Census, FT-246, *Annual U.S. Imports for Consumption and General Imports*, 1993 through 2002.

The Bureau of the Census obtains data on crude oil imports from the U.S. Customs Service. (See “Information on Data Source Differences and Adjustments,” located on page xxxii). In order to import crude oil or petroleum products into the United States, either U.S. Customs Form CF-7501, “Entry Summary,” or U.S. Customs Form CF-7505, “Warehouse Withdrawal for Consumption,” must be filed. Those forms are processed, tabulated, and published in Census Bureau report FT-246, *Annual U.S. Imports for Consumption and General Imports*. Data on imports into Puerto Rico and other U.S. possessions are excluded from Census data. The Census data are adjusted for comparison purposes because their geographic coverage differs from that for the *PSA* data. In 2002, the adjusted Census data were 2.5 percent higher than the *PSA* annual volumes. The difference represents only a 0.6 percent increase over 2001 data, although the reason for the increase is not readily apparent. For the 10-year period 1993 through 2002, the average absolute difference between *PSA* and CENSUS data was 2.6 percent.

Product Supplied

Product supplied, as reported in the *PSA*, is used to measure the volume of petroleum products available for domestic consumption. These data are generated for each petroleum product by adding field production, refinery production, and imports minus (-) stock change, refinery inputs, and exports. Product supplied measures products from primary sources, i.e., from refineries, natural gas processing plants, blending plants, pipelines, and bulk terminals.

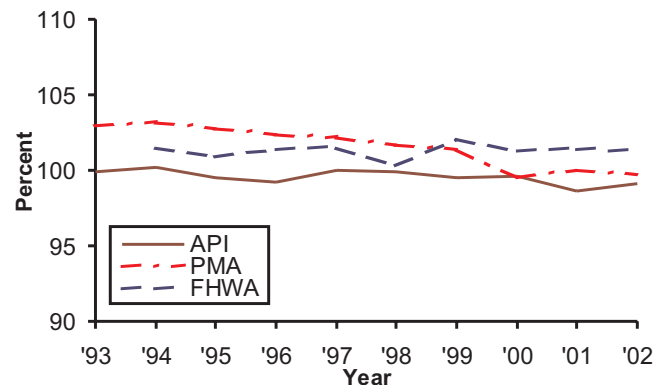
Motor Gasoline Supplied

PSA statistics on motor gasoline supplied are compared with data from the EIA’s Petroleum Division’s marketing surveys, the American Petroleum Institute (API), and the Federal Highway Administration (FHWA) (Table FE3/Figure FE3). PD Form

EIA-782C, “Monthly Report of Prime Supplier Sales Volumes of Petroleum Products for Local Consumption,” is used to monitor prime suppliers’ sales to local distributors, local retailers, or end users. These data are published in the *Petroleum Marketing Annual* (PMA) and are available electronically after 1994. The respondent universe consists of refiners and gas plant operators, importers, and resellers or retailers. Approximately 170 firms make up the EIA-782C survey respondents. In 2002, the *PMA* volume of motor gasoline was 0.3 percent below the *PSA* volume. For the 10-year period 1993 through 2002, the average absolute difference between *PSA* and *PMA* data was 1.7 percent.

API statistics on motor gasoline delivered from primary storage are published in their *Monthly Statistical Report*. The API statistics are similar in concept to EIA’s product supplied. The data represent production plus imports for motor gasoline (adjusted for net stock change) minus exports. Those statistics are

Figure FE3. A Comparison of Motor Gas Supplied, 1993-2002 (As a Percent of PSA)



Source: Energy Information Administration, *Petroleum Supply Annual*, Table FE3.

Table FE3. A Comparison of Data Series for Motor Gasoline Supplied for Domestic Use, 1993-2002

Year	PSA		PMA		API		FHWA	
	Million Barrels	Million Barrels	Percent of PSA	Million Barrels	Percent of PSA	Million Barrels	Percent of PSA	
2002	3,229	3,218	99.7	3,199	99.1	3,270	101.3	
2001	3,143	3,144	100.0	3,098	98.6	3,185	101.4	
2000	3,101	3,084	99.5	3,079	99.6	3,142	101.3	
1999	3,077	3,121	101.4	3,062	99.5	3,141	102.1	
1998	3,012	3,064	101.7	3,008	99.9	3,051	101.3	
1997	2,926	2,991	102.2	2,927	100.0	2,969	101.5	
1996	2,888	2,958	102.4	2,856	99.2	2,928	101.4	
1995	2,843	2,919	102.7	2,829	99.5	2,869	100.9	
1994	2,774	2,861	103.1	2,780	100.2	2,815	101.5	
1993	2,729	2,807	102.9	2,725	99.9	--	--	

Sources: PSA: *Petroleum Supply Annual*, 1993 through 2002, Table 2. PMA: *Petroleum Marketing Annual*, 1993, Table 47; 1994 through 2002, Table 48. API: American Petroleum Institute, *Monthly Statistical Report*, 1993 through 2002. FHWA: Federal Highway Administration, *Highway Statistics*, 1993 through 2002, Tables MF-24 and MF-21. -- = Data were excluded in 1993.

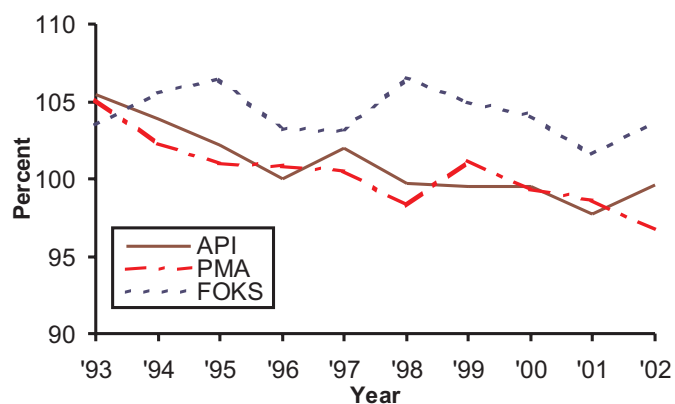
based on an historical analysis of the industry and information provided on a voluntary basis by importers of record (licensed importers) and by operators of refineries, bulk terminals, and pipelines. For the 10-year period 1993 through 2002, the average absolute difference between API and *PSA* statistics was 0.5.

Data from the FHWA on total gasoline usage are based on volumes of gasoline reported to State motor fuel tax agencies by wholesale distributors. The FHWA's publication "*Highway Statistics*" includes data on both highway and non-highway use of gasoline. To adjust for comparison purposes, aviation gasoline use is subtracted from the FHWA data by the EIA. Data from 1993 are excluded from this analysis due to changes by FHWA in their estimation procedures for private and commercial highway use. For the 9-year period 1994 through 2002, the average absolute difference between *PSA* and FHWA data was 1.4 percent.

Distillate Fuel Oil Supplied

Statistics for distillate fuel oil (including kerosene) supplied from the *PSA* are compared with EIA's *PMA* data on distillate fuel oil sales collected from survey Form EIA-782C, "Monthly Report of Prime Supplier Sales Volumes of Petroleum Products for Local Consumption; Form EIA-821, "Annual Fuel Oil and Kerosene Sales Report (FOKS)," and API data on distillate fuel oil delivered from primary storage (Table FE4/Figure FE4). Data on kerosene were discontinued in API's *Monthly Statistical Report*. To adjust for this, kerosene volumes from the *PSA* were added to API data for comparison purposes. API statistics on distillate fuel oil supplied generally have been comparable to *PSA* statistics, having an average absolute difference within 1.8 percent of each other for the last ten years. The Fuel Oil And Kerosene Sales Report

Figure FE4. A Comparison of Distillate Supplied, 1993-2002 (As a Percent of PSA)



Source: Energy Information Administration, *Petroleum Supply Annual*, Table FE4.

provides data on end-use sales of distillate fuel oil and kerosene. For the 10-year period 1993 through 2002, the average absolute difference between *PSA* and FOKS data was 4.3 percent.

Until recently, the *PMA* statistics for prime suppliers sales of distillate fuel oil sold into States for consumption had been consistently higher than the *PSA* statistics. However, since 2000 the *PMA* statistics have decreased from 0.7 percent to 3.3 percent below *PSA* statistics. For the last 10 years, the average absolute difference between *PSA* and *PMA* data was 1.8 percent.

Table FE4. A Comparison of Data Series for Distillate Fuel Oil (including Kerosene) Supplied, 1993-2002

Year	<i>PSA</i>		<i>PMA</i>		FOKS		API ^a	
	Million Barrels	Percent of <i>PSA</i>	Million Barrels	Percent of <i>PSA</i>	Million Barrels	Percent of <i>PSA</i>	Million Barrels	Percent of <i>PSA</i>
2002	1,378	96.7	1,333	96.7	1,429	103.7	1,372	99.6
2001	1,404	98.6	1,385	98.6	1,453	101.6	1,372	97.7
2000	1,359	99.3	1,350	99.3	1,444	104.1	1,352	99.5
1999	1,304	101.2	1,320	101.2	1,397	105.0	1,297	99.5
1998	1,292	98.3	1,270	98.3	1,345	106.5	1,259	99.7
1997	1,254	100.5	1,260	100.5	1,318	103.1	1,279	102.0
1996	1,254	100.8	1,264	100.8	1,294	103.2	1,228	100.0
1995	1,190	101.0	1,202	101.0	1,245	106.4	1,197	102.2
1994	1,172	102.3	1,199	102.3	1,218	105.5	1,199	103.9
1993	1,110	105.1	1,167	105.1	1,168	103.5	1,170	105.4

^aAPI statistics include *PSA* statistics for kerosene for 1993 through 2002.

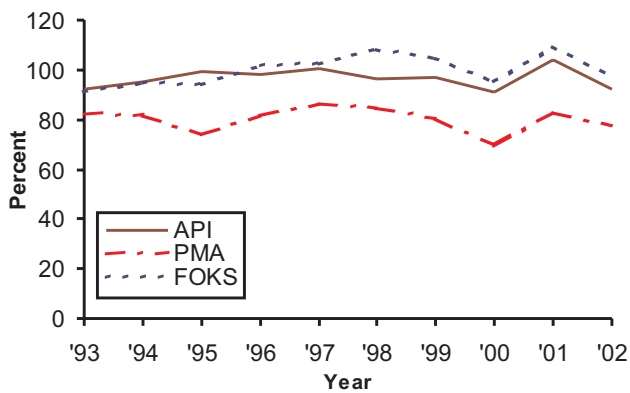
Sources: *PSA*: *Petroleum Supply Annual*, 1993 through 2002, Table 2. *PMA*: *Petroleum Marketing Annual*, 1993, Table 49; 1994 through 2002, Table 50. *Fuel Oil and Kerosene Sales Report*, 1993 through 2002. API: American Petroleum Institute, *Monthly Statistical Report*, 1993 through 2002.

Table FE5. A Comparison of Data Series for Residual Fuel Oil Supplied for Domestic Use, 1993-2002

Year	PSA		PMA		FOKS		API	
	Million Barrels	Million Barrels	Percent of PSA	Million Barrels	Percent of PSA	Million Barrels	Percent of PSA	
2002	255	197	77.3	247	96.9	235	92.2	
2001	296	245	82.8	324	109.5	328	104.1	
2000	332	232	69.9	315	94.9	303	91.3	
1999	303	244	80.5	317	104.6	293	96.7	
1998	324	274	84.6	351	108.3	312	96.3	
1997	291	252	86.6	298	102.4	293	100.7	
1996	310	253	81.6	316	101.9	304	98.1	
1995	311	229	73.6	293	94.2	308	99.4	
1994	373	304	81.5	353	94.6	354	94.9	
1993	394	323	82.0	359	91.1	363	92.1	

Sources: PSA: *Petroleum Supply Annual*, 1993 through 2002, Table 2. PMA: *Petroleum Marketing Annual*, 1993, Table 48; 1994 through 2002, Table 49. *Fuel Oil and Kerosene Sales Report*, 1993 through 2002, Table 2. API: American Petroleum Institute, *Monthly Statistical Report*, 1993 through 2002.

Figure FE5. A Comparison of Residual Supplied, 1993-2002 (As a Percent of PSA)



Source: Energy Information Administration, *Petroleum Supply Annual*, Table FE5.

Residual Fuel Oil Supplied

Product supplied data from the *PSA* for residual fuel oil are compared with *PMA* data on prime suppliers' sales of residual fuel oil, Form-821 "Annual Fuel Oil and Kerosene Sales," and API data on residual fuel oil delivered (Table FE5/Figure FE5). The *PMA* statistics for residual fuel oil are historically lower than the *PSA* statistics. A primary reason for the difference between *PMA* and *PSA* data may be because *PMA* Form EIA-782C is a sales survey, with volumes based on transfer of ownership (equity basis), while *PSA* Form EIA-810 is a supply survey, with volumes

reported on the basis of the amount of petroleum in custody, regardless of ownership (custody basis). Residual fuel oil imported by electric utilities for their own use may not be reported on Form EIA-782C because a transfer of ownership (sale) did not occur in the United States. For the 10-year period 1993 through 2002, the average absolute difference between *PSA* and *PMA* data was 19.9 percent. The Fuel Oil And Kerosene Sales Report provides data on end-use sales of residual fuel oil. The divergence between *PSA* and FOKS data may be due to fuel switching in the the electric power sector. For the 10-year period 1993 through 2002, the average absolute difference between *PSA* and FOKS data was 5.5 percent. The API volumes of residual fuel oil supplied were close to *PSA* volumes over the same 10-year period, while the average absolute difference between *PSA* and API data was 4.4 percent.

Conclusion

For comparison purposes, it must be recognized that differences probably will always exist given the various data collection processes employed by the respective organizations. The makeup of the sampling frames, the inclusion or exclusion of data from related survey forms, and how survey data are compiled or aggregated, are just three of the many reasons why the data from one survey may differ from those of another. Although *PSA* statistics were in relative proximity to other sources of petroleum data, the primary focus is to keep the data differences within as narrow a range as possible. Future efforts will involve analysis of the differences as they relate to relevant issues, problems, or situations and how the data collection process may impact or be impacted by them.

Information on Data Source Differences and Adjustments

American Petroleum Institute: In this article, API's annual statistics are totals of initial monthly values. The initial monthly estimate published by API is derived from API sources. However, later API publications reflect revisions which make use of EIA data. *PSA* statistics on crude oil include imports for the Strategic Petroleum Reserve (SPR) while API statistics do not. Therefore, the following figures for SPR were added to the API figures: 5.8 million barrels in 2002, 3.9 million barrels in 2001, 3.0 million barrels in 2000, 3.0 million barrels in 1999, none in 1998, 1997, 1996, or 1995, 4.5 million barrels in 1994 and 5.4 million barrels in 1993. The API publishes monthly estimates of motor gasoline, distillate fuel oil and residual fuel oil delivered from primary storage in thousand barrels per day. However, the API discontinued publishing kerosene data in 1982. *PSA* values for kerosene supplied (16 million barrels in 2002, 26 million barrels in 2001, 25 million barrels in 2000, 27 million barrels in 1999, 28 million barrels in 1998, 24 million barrels in 1997, 23 million barrels in 1996, 20 million barrels in 1995, 18 million barrels in 1994, and 18 million barrels in 1993) were added to API distillate totals.

Oil and Gas Journal: The *Oil and Gas Journal* publishes weekly averages of crude oil production in thousand barrels per day. Those averages are used to produce monthly totals as follows: the average for each week is used as a daily production estimate for each of the days the week covers. For each month, the production estimates for days covered by the month are summed. The totals are converted from thousand to million barrels for this article.

Federal Highway Administration: Data on both highway and non-highway use of gasoline (Table MF-21), excluding aviation gasoline (Table MF-24), are from the *Highway Statistics* publication and are based on volumes of total gasoline consumption.

U.S. Bureau of the Census: Since 1986, Census data have been available through the FT-246, *Annual U.S. Imports for Consumption and General Imports*. Imports into Puerto Rico and the Virgin Islands are excluded from the Census data but not in the *PSA* data. The Census excludes data on imports into the United States from Puerto Rico and the Virgin Islands.

Petroleum Division: EIA's Petroleum Division data are from the Form EIA-782C, "Monthly Report of Prime Supplier Sales Volumes of Petroleum Products for Local Consumption." The prime supplier, imports, into a State, or transports product across State boundaries and local marketing areas and sells the product to local distributors, local retailers, or end users. The report on *Fuel Oil and Kerosene Sales* provides information and State-level data on end-use sales of distillate fuel oil, kerosene, and residual fuel oil. The *Petroleum Supply Annual* contains information on the supply and disposition of crude oil and petroleum products.