Section 7. Consumption Adjustments for Calculating Expenditures

Expenditures developed in the EIA State Energy Data System (SEDS) are calculated by multiplying the price estimates by the SEDS consumption estimates. The consumption estimates are adjusted to remove process fuel, intermediate petroleum products, electricity exports, and other consumption that has no direct fuel costs, i.e., hydroelectric, geothermal, wind, solar and photovoltaic energy sources, and some wood and waste.

Almost all aspects of energy production, processing, and distribution consume energy as an inherent part of those activities. SEDS industrial and transportation sector consumption estimates include energy consumed in the process of providing energy to the end-use consumer and are called "process fuel." Familiar examples include energy sources used in drilling for oil and gas and transporting natural gas and petroleum by pipeline. Another "process fuel" is the energy used in generating and delivering electricity to end users. Energy products that are subsequently incorporated into another energy product for end-use consumption are called "intermediate products." Motor gasoline blending components are familiar examples of intermediate products that are consumed as part of the finished motor gasoline sold at service stations and other outlets.

Process fuel and intermediate products are not purchased by the end user and, therefore, do not have prices. Although the end user does not consume either process fuel or intermediate products directly, he does pay for them, because the cost to the processor or distributor is passed on to the end user in the price of the final end-user product. If their use was left in the consumption estimates and was assigned prices, the expenditures would be counted twice, first as paid by the "processor" (producer, processor, or transporter) and again as included in the price to the end user.

Some renewable energy sources are not purchased. These include hydroelectric, geothermal, wind, photovoltaic, and solar thermal energy. The consumption of these sources, which are measured in SEDS as kilowatthours of electricity produced, are not included in the State energy expenditure estimates since there are no "fuel costs" involved. Wood and waste can be purchased or obtained at no cost. Wood consumption estimates in the residential sector, and wood and waste in the commercial and industrial sectors are adjusted in SEDS to remove estimated quantities that were obtained at no cost.

To estimate energy expenditures in the price and expenditure tables, the consumption of process fuel, intermediate products, and some of the renewable energy sources are subtracted from the end-use sector in which they are included in SEDS, either the residential, commercial, industrial, or transportation sector, and there are no prices associated with them.

Process fuel consumption adjustments include:

1. Fuel (petroleum, natural gas, steam coal) and electricity consumed at refineries
2. Crude oil lease, plant, and pipeline fuel
3. Natural gas lease and plant fuel
4. Natural gas pipeline fuel
5. Electrical system energy losses (i.e., energy consumed in the generation, transmission, and distribution of electricity).
6. Energy losses and co-products from the production of fuel ethanol.

Intermediate product consumption adjustments include:

1. Aviation gasoline blending components
2. Motor gasoline blending components
3. Natural gasoline (1970 through 1983)
4. Pentanes plus (1984 forward)

5. Plant condensate (1970 through 1983)
6. Unfinished oils
7. Unfractionated stream (1970 through 1983).

Starting in 1984, natural gasoline (including isopentane) and plant condensate are reported together as the new product, pentanes plus, and the components of unfractionated stream are reported separately under liquefied petroleum gases.

Renewable energy consumption adjustments include:

1. Photovoltaic and solar thermal energy in the residential (including commercial) sector and electric power sector;
2. Geothermal energy in the residential, commercial, industrial, and electric power sectors;
3. Electricity generated from hydropower in the commercial, industrial, and electric power sectors; and
4. Electricity generated from wind energy in the electric power sector; and
5. Estimated portions of wood consumed in the residential sector, and wood and waste in the commercial and industrial sectors that were obtained at no cost.

In addition, while consumption of supplemental gaseous fuels (SGF) are removed from SEDS total consumption estimates to prevent double-counting in both natural gas and the fossil fuels from which they are derived, prices and expenditures of SGF cannot be separately identified and are therefore not adjusted for double-counting in total energy average prices and total energy expenditure calculations.

Table TN55 shows the quantities of energy, by State, removed from SEDS consumption to calculate expenditures for 2007. Table TN56 shows the adjustments made to SEDS national consumption estimates for 1970 through 2007 to derive the net consumption data used to calculate expenditures.

State adjustment estimates from 1970 forward are available in the SEDS Internet data file, http://www.eia.doe.gov/emeu/states/sep_prices/total/csv/pr_adjust_consum.csv.

Adjustment Procedures

Hydroelectricity, Geothermal, Wind, Photovoltaic, and Solar Thermal Energy. Electricity generated from hydropower and geothermal, wind, photovoltaic, and solar thermal energy has no fuel cost. Operation and maintenance costs associated with these energy sources are included indirectly in the prices of the electricity sold by power producers. Therefore, use of these renewable sources for electricity generation is removed from the expenditure calculations. Direct use of geothermal and solar energy also has no fuel cost and is omitted from SEDS energy expenditure calculations.

Residential Wood. Some residential wood is purchased and some acquired at no cost. Based on responses to the Form EIA-457, "1980 Residential Energy Consumption Survey," Census division percentages of wood purchased were developed and applied to the residential wood consumption in each State in the divisions in 1970 through 1989. Based on responses to the Form EIA-457, "1993 Residential Energy Consumption Survey," Census region percentages were developed and applied to the residential wood consumption of the States in each region in 1990 forward.

Commercial Wood and Waste. Some commercial wood and waste is purchased and some acquired at no cost. Conventional commercial wood acquired at no cost was estimated using the same percentages used for the residential sector. Wood and waste acquired at no cost by commercial combined heat-and-power facilities was estimated using the U.S. annual average percentages of wood and percentages of waste acquired at no cost by the electric power sector.

Industrial Wood and Waste. The cost of wood and waste products used for energy vary widely from more expensive woods to free industrial waste products. Industrial consumption is broken into two segments, manufacturing industries and combined heat and power (CHP) facilities in order to estimate quantities received at no cost.

Adjustments to manufacturing wood and waste consumption in 1994 forward are based on information gathered on the Form EIA-846, "1994 Manufacturing Energy Survey (MECS)." Adjustments to manufacturing consumption in 1980 through 1993 are based on information gathered on the Form EIA-846, "1991 Manufacturing Energy Survey." Adjustments to industrial wood and waste consumption in 1970 through

Table TN55. Energy Consumption Adjustments for Calculating Expenditures by State, 2007
(Billion Btu)

State	Refinery Use							
	Distillate Fuel Oil	Residual Fuel Oil	LPG	Other Petroleum [a]	Natural Gas [b]	Coal	Electricity [c]	Total
AK	167	—	34	34,723	33,007	—	267	68,198
AL	73	3	2	14,248	20,168	—	11,826	46,321
AR	105	—	2	11,479	10,183	—	5,832	27,602
AZ	—	—	—	221	—	—	—	221
CA	711	111	3,980	260,514	92,045	—	9,750	367,112
CO	—	—	30	11,646	11,785	—	2,122	25,582
CT	—	—	—	493	—	—	—	493
DC	—	—	—	—	—	—	—	—
DE	2	544	16	26,377	1,208	15	435	28,597
FL	—	—	—	1,874	—	—	—	1,874
GA	—	—	—	3,615	—	—	—	3,615
HI	28	4,524	121	15,797	59	—	745	21,275
IA	—	—	—	1,284	—	—	—	1,284
ID	—	—	—	—	—	—	—	—
IL	42	21	771	113,541	16,676	20	4,743	135,815
IN	30	79	132	55,070	18,017	34	5,219	78,581
KS	24	117	794	36,865	9,358	1	1,137	48,295
KY	23	26	387	32,619	7,465	9	4,632	45,161
LA	75	2	85	394,773	124,693	—	9,088	528,718
MA	—	—	—	1,026	—	—	—	1,026
MD	—	—	—	207	—	—	—	207
ME	—	—	—	—	—	—	—	—
MI	15	243	215	15,960	12,359	11	3,537	32,341
MN	25	198	242	42,197	7,482	6	2,406	52,557
MO	—	—	—	719	—	—	—	719
MS	46	—	1	41,572	13,249	—	5,292	60,161
MT	—	—	8	23,106	2,184	—	997	26,296
NC	—	—	—	4,426	—	—	—	4,426
ND	19	17	64	7,582	1,705	23	378	9,789
NE	—	—	—	143	—	—	—	143
NH	—	—	—	—	—	—	—	—
NJ	11	536	55	98,703	4,803	—	1,555	105,664
NM	35	1	8	15,264	12,099	—	2,272	29,678
NV	222	—	247	185	1,582	—	2,680	4,916
NY	—	—	—	3,370	—	—	—	3,370
OH	29	227	148	66,440	19,819	12	6,183	92,858
OK	20	33	41	59,264	16,655	4	1,587	77,603
OR	—	—	—	166	—	—	—	166
PA	44	1,360	497	105,506	15,020	326	6,860	129,613
RI	—	—	—	—	—	—	—	—
SC	—	—	—	3,954	—	—	—	3,954
SD	—	—	—	—	—	—	—	—
TN	17	41	61	26,403	6,175	20	3,534	36,251
TX	335	12	649	633,025	193,640	—	35,407	863,069
UT	—	418	5	21,000	3,996	—	1,418	26,837
VA	40	1,707	78	12,129	5,751	281	2,673	22,658
VT	—	—	—	—	—	—	—	—
WA	246	36	699	73,417	8,606	—	4,003	87,007
WI	28	186	169	5,511	7,924	10	2,656	16,484
WV	30	1,046	19	7,521	3,192	152	2,070	14,029
WY	—	103	4	19,453	5,210	—	1,413	26,183
US	2,447	11,593	9,563	2,303,390	686,114	923	142,721	3,156,751

See footnotes at end of table.

Table TN55. Energy Consumption Adjustments for Calculating Expenditures by State, 2007 (Continued)

(Billion Btu)

State	Residential		Commercial		Industrial						Transportation	Electrical System Energy Losses	Total
	Geothermal and Solar/PV [d]	Wood	Geothermal and Hydro-electricity	Wood and Waste	Crude Oil Lease, Plant, and Pipeline Fuel	Natural Gas Lease and Plant Fuel	Hydro-electricity	Geothermal	Wood and Waste	Ethanol Production Losses [e]	Natural Gas Pipeline Fuel		
AK	53	802	35	126	—	269,860	—	—	26	NA	2,125	45,262	386,486
AL	146	5,056	—	792	—	19,920	—	41	18,181	NA	16,021	676,018	782,496
AR	537	1,639	—	269	—	1,905	—	20	8,309	NA	10,233	346,408	396,923
AZ	3,699	7,541	48	1,195	—	21	—	224	797	NA	20,921	568,276	602,943
CA	21,762	15,038	763	3,427	—	60,215	—	1,375	13,457	NA	9,105	1,945,229	2,437,481
CO	472	6,152	210	964	—	56,506	—	245	206	NA	14,084	377,651	482,073
CT	1,049	1,828	—	286	—	—	—	—	3,623	NA	4,487	251,250	263,016
DC	1	571	—	89	—	—	—	—	—	NA	487	89,152	90,301
DE	268	764	—	120	—	—	—	—	53	NA	16	87,375	117,193
FL	37,543	1,349	1,324	332	—	1,431	—	—	16,938	NA	10,900	1,701,185	1,772,876
GA	525	7,679	7	1,203	—	—	190	20	16,611	NA	5,317	1,011,900	1,047,065
HI	2,042	—	6	464	—	—	373	2	912	NA	3	78,261	103,338
IA	292	4,216	517	813	—	—	—	—	21,740	NA	12,626	333,262	374,751
ID	85	1,785	562	280	—	—	—	913	3,091	NA	7,722	174,879	189,317
IL	2,477	16,079	—	2,521	—	50	—	—	13,549	NA	11,719	1,075,220	1,257,432
IN	2,343	8,516	517	1,486	—	104	—	—	17,155	NA	7,206	805,523	921,429
KS	124	3,864	540	606	—	15,951	—	—	2,715	NA	25,214	295,691	393,000
KY	1,127	4,533	540	710	—	3,458	—	—	4,604	NA	12,206	680,255	752,595
LA	654	2,547	540	399	—	206,794	—	41	16,496	NA	53,982	585,751	1,395,921
MA	324	3,457	566	750	—	—	135	—	3,218	NA	1,751	420,641	431,868
MD	433	4,635	—	909	—	—	—	—	3,938	NA	2,423	481,389	493,935
ME	181	878	—	483	—	—	6,863	—	9,697	NA	850	87,312	106,263
MI	3,059	13,983	531	3,070	—	9,900	258	—	9,719	NA	26,595	804,614	904,071
MN	813	7,269	—	1,248	—	—	944	—	11,459	NA	20,728	502,300	597,319
MO	250	8,378	—	1,313	—	—	—	—	4,852	NA	2,761	629,671	647,944
MS	33	3,001	560	470	—	8,503	—	41	3,600	NA	28,109	354,491	458,969
MT	69	1,284	143	201	—	5,223	—	69	1,453	NA	7,932	114,342	157,012
NC	793	8,044	73	1,261	—	—	20	—	9,670	NA	5,165	970,872	1,000,324
ND	310	983	282	154	—	7,352	—	—	1,306	NA	14,639	87,647	122,462
NE	212	2,476	616	417	—	185	—	—	4,312	NA	5,471	207,957	221,789
NH	89	749	—	117	—	—	44	—	1,097	NA	18	82,715	84,830
NJ	2,397	2,586	—	407	—	—	—	—	2,171	NA	1,567	603,179	717,972
NM	238	2,513	79	394	—	85,585	—	648	297	NA	13,847	163,927	297,206
NV	1,428	3,056	645	479	—	5	—	412	462	NA	3,121	262,397	276,921
NY	1,587	19,915	606	3,630	—	673	578	—	7,359	NA	13,091	1,090,844	1,141,653
OH	1,727	15,651	531	2,453	—	910	—	—	8,941	NA	14,252	1,190,915	1,328,236
OK	44	2,086	—	327	—	70,743	—	—	4,852	NA	30,306	406,318	592,279
OR	1,735	4,509	534	734	—	24	—	187	9,053	NA	9,718	358,811	385,470
PA	1,534	4,072	517	1,055	—	5,837	—	—	17,055	NA	36,225	1,115,841	1,311,750
RI	49	575	—	90	—	—	—	—	54	NA	855	58,990	60,614
SC	404	3,935	7	862	—	—	—	—	12,962	NA	2,704	603,281	628,110
SD	188	1,123	700	176	—	574	—	51	110	NA	5,704	78,059	86,685
TN	157	6,407	—	1,004	—	114	—	—	9,487	NA	10,382	785,622	849,425
TX	1,584	11,187	565	1,854	—	329,956	—	—	9,484	NA	92,481	2,531,176	3,841,356
UT	78	2,619	287	439	—	26,026	—	393	135	NA	12,719	204,549	274,082
VA	1,030	6,481	560	2,054	—	3,281	67	—	10,690	NA	7,209	821,346	875,377
VT	87	395	—	62	—	—	15	—	1,061	NA	16	43,169	44,805
WA	200	7,673	1,115	1,203	—	—	26	—	13,574	NA	7,600	631,210	749,607
WI	580	7,833	12	1,308	—	—	1,769	—	31,910	NA	2,889	524,903	587,690
WV	75	1,778	3	279	—	7,296	4,433	—	946	NA	22,411	251,653	302,903
WY	6	706	623	111	—	32,142	—	18	101	NA	15,206	114,369	189,465
US	96,896	250,197	15,164	45,395	—	1,230,545	15,715	4,700	363,488	378,010	643,119	27,713,059	33,913,038

[a] In this table, "other petroleum" consists of: still gas and petroleum coke consumed as process fuel; and aviation gasoline blending components, motor gasoline blending components, pentanes plus, and unfinished oils used as intermediate products.
[b] Natural gas including supplemental gaseous fuels.
[c] Electricity is converted at the rate of 3,412 Btu per kilowatthour.
[d] Solar thermal and photovoltaic energy. Includes small amounts consumed by the commercial sector that cannot be separately identified.
[e] Energy losses and co-products from the production of fuel ethanol. Only U.S. total is available.
— = No consumption. NA = Not available.
Source: EIA, State Energy Data System.

Table TN56. Energy Consumption Adjustments for Calculating Expenditures, 1970 Through 2007
(Trillion Btu)

Year	Total (Gross) Consumption	Adjustments														Consumption used in Expenditure Calculations [c]
		Residential		Commercial		Industrial							Transportation	Electrical System Energy Losses	Total	
		Geothermal and Solar/PV [a]	Wood	Geothermal and Hydroelectricity	Wood and Waste	Refinery Use	Crude Oil Lease, Plant, and Pipeline Fuel	Natural Gas Lease and Plant Fuel	Hydroelectricity	Geothermal	Wood and Waste	Ethanol Production Losses [b]	Natural Gas Pipeline Fuel			
1970	67,747	—	298	—	6	2,714	—	1,442	34	—	788	—	740	11,503	17,525	50,222
1971	69,193	—	284	—	5	2,694	—	1,456	34	—	804	—	761	12,103	18,140	51,053
1972	72,721	—	282	—	5	2,847	—	1,497	34	—	859	—	786	13,056	19,366	53,355
1973	75,778	—	263	—	5	3,010	—	1,539	35	—	900	—	745	13,900	20,395	55,382
1974	73,975	—	275	—	5	2,983	—	1,520	33	—	896	—	684	14,109	20,506	53,470
1975	72,023	—	316	—	6	2,884	—	1,434	32	—	822	—	595	14,341	20,430	51,593
1976	76,043	—	357	—	7	2,907	—	1,679	33	—	942	—	559	15,195	21,679	54,364
1977	78,028	—	402	—	8	3,008	—	1,706	33	—	989	—	544	15,938	22,627	55,401
1978	80,055	—	462	—	9	2,939	—	1,694	32	—	1,081	—	541	16,713	23,471	56,584
1979	80,926	—	543	—	10	3,078	—	1,534	34	—	1,086	—	613	16,922	23,819	57,107
1980	78,150	—	627	—	16	R 3,052	—	1,058	33	—	1,283	—	650	17,235	R 23,954	R 54,347
1981	R 76,205	—	651	—	16	R 2,204	—	959	33	—	1,354	6	660	17,225	R 23,106	R 53,272
1982	R 73,113	—	724	—	16	R 2,089	—	1,144	33	—	1,310	16	614	16,889	R 22,834	R 50,423
1983	R 73,000	—	722	—	16	R 2,121	140	1,010	33	—	1,480	28	505	17,327	R 23,384	R 49,746
1984	R 76,655	—	733	—	16	R 2,254	135	1,113	33	—	1,510	34	545	17,875	R 24,249	R 52,516
1985	R 76,565	—	755	—	18	R 2,046	128	1,001	33	—	1,503	41	521	18,265	R 24,312	R 52,378
1986	R 76,750	—	688	—	20	2,285	103	954	33	—	1,478	47	501	18,247	R 24,357	R 52,506
1987	R 79,123	—	634	—	22	2,485	72	1,194	33	—	1,472	54	538	18,675	R 25,179	R 54,042
1988	R 82,872	—	676	—	24	2,696	85	1,134	33	—	1,531	54	633	19,589	R 26,456	R 56,515
1989	R 84,933	58	684	3	73	2,710	59	1,103	28	2	684	55	650	21,006	R 27,113	R 57,924
1990	R 84,672	61	337	4	59	R 2,803	51	1,269	31	2	716	48	682	21,420	R 27,484	R 57,306
1991	R 84,605	64	353	4	60	R 2,668	39	1,164	30	2	685	56	621	21,613	R 27,359	R 57,353
1992	R 85,960	66	371	4	66	R 2,954	27	1,208	31	2	689	63	608	21,479	R 27,570	R 58,503
1993	R 87,629	68	308	4	68	R 2,878	21	1,199	30	2	642	74	643	22,275	R 28,212	R 59,531
1994	R 89,283	70	292	5	66	R 2,991	19	1,153	62	3	662	82	706	22,564	R 28,677	R 60,712
1995	R 91,235	71	292	6	66	R 2,915	15	1,253	55	3	445	86	723	23,356	R 29,285	R 62,055
1996	R 94,244	72	303	7	77	R 3,203	14	1,280	61	3	495	61	734	24,068	R 30,380	R 63,970
1997	R 94,910	72	233	7	80	R 3,196	5	1,251	58	3	493	81	781	24,325	R 30,586	R 64,423
1998	R 95,192	72	207	8	71	R 3,042	—	1,212	55	3	493	88	657	25,262	R 31,171	R 64,117
1999	R 96,804	72	218	9	66	R 3,051	—	1,103	49	4	495	92	663	25,849	R 31,669	R 65,229
2000	R 98,866	70	235	9	67	R 2,941	—	1,110	42	4	459	101	659	26,558	R 32,253	R 66,699
2001	R 96,296	69	210	9	46	R 3,152	—	1,139	33	5	437	110	641	25,814	R 31,664	R 64,713
2002	R 98,033	69	213	9	43	R 3,060	—	1,175	39	5	312	133	696	26,365	R 32,117	R 65,980
2003	R 98,436	71	225	12	46	3,174	—	1,186	43	3	315	174	614	26,306	R 32,169	R 66,332
2004	R 100,213	73	230	13	46	R 3,092	—	1,116	33	4	536	210	582	R 26,781	R 32,715	R 67,556
2005	R 100,465	77	R 249	14	R 49	R 3,107	—	1,140	32	4	335	241	603	27,323	R 33,174	R 67,350
2006	R 99,841	85	227	15	45	3,187	—	R 1,174	29	4	346	301	605	27,079	33,097	66,806
2007	101,468	97	250	15	45	3,157	—	1,231	16	5	363	378	643	27,713	33,913	67,628

[a] Solar thermal and photovoltaic energy. Includes small amounts consumed by the commercial sector that cannot be separately identified. See Section 5 of the Technical Notes for explanation of estimation methodology.

[b] Energy losses and co-products from the production of fuel ethanol.

[c] Includes adjustments of supplemental gaseous fuels and processed fuels not shown on this table.

— = No consumption.

R = Revised data.

Note: Totals may not equal sum of components due to independent rounding.

Sources: EIA, State Energy Data System. All data are available via the full-precision data file (CSV) at http://www.eia.doe.gov/emeu/states/sep_prices/total/csv/pr_adjust_consum.csv. See also the following individual data series shown at http://www.eia.doe.gov/emeu/states/sep_use/total/pdf/use_us.pdf:
Total (Gross) Consumption: Table 7 • **Residential Geothermal and Solar/PV:** Table 8 • **Commercial Geothermal and Hydroelectricity:** Table 9 • **Industrial Hydroelectricity:** Table 10.

1979 are based on the 1980 average ratios for each State. The 1991 and 1994 MECS report the quantities consumed and quantities purchased of five types of wood and waste in each of four (MECS 1991) or five (MECS 1994) SIC categories of industries. The two quantity series are used to calculate SIC category average percentages of wood and waste obtained at no cost. These percentages are applied to the estimated consumption in those SIC categories in each State to estimate the State's manufacturing uncosted wood and waste.

Estimates of wood and waste obtained at no charge by industrial CHP facilities for 1989 forward are estimated using the U.S. annual average percentages of wood and percentages of waste acquired at no cost by the electric power sector.

Each State's industrial wood and waste consumption quantities acquired at no cost are the sum of the estimated manufacturing and CHP facilities' quantities for each year.

Refinery Fuel. Petroleum refinery consumption of distillate fuel, residual fuel, liquefied petroleum gases, petroleum coke, still gas, natural gas, steam coal, and electricity is estimated for each State and subtracted from the State's industrial sector total of each energy source.

Refineries' consumption of each fuel is available in the data sources by State or group of States (1970 through 1980) and by Petroleum Administration for Defense (PAD) districts or subdistricts (1981 forward). Where State-level data for the individual fuels are not available, they are estimated by allocating the group or district's values to the States with operating refineries within that group or district. The refining States' industrial sector consumption of each fuel is added together for each group or district to derive that group or district's industrial sector consumption subtotal. Then each State's portion of the group or district's refinery fuel consumption is calculated in proportion to its share of the group or district's industrial sector consumption subtotal.

In some cases, the estimated State refinery fuel consumption of residual fuel or LPG exceeds the estimate of the total industrial sector consumption of that fuel for that State. For 1970 through 2006, the refinery fuel consumption for the PAD district or subdistrict, group of States, or individual State is reduced until each State has positive industrial consumption. The excess refinery fuel is reallocated to a different PAD district or subdistrict, group of States or individual State as shown in Table TN57. When this adjustment involves a PAD district or subdistrict or group value, the refineries' consumption estimates for all States within the PAD district or subdistrict or group are recalculated using these new values. In 2007, this adjustment is no longer made.

Table TN57. Reallocations of Excess Refinery Fuel Consumption, 1970 Through 2006

Year	Fuel	Thousand Barrels	Excess in:	Reallocated to:
1971	Residual Fuel Oil	294	Kansas	Oklahoma
1973	Residual Fuel Oil	45	Group 4: Kentucky, Tennessee	Illinois
1979	LPG	173	Montana	Wyoming
1985	Residual Fuel Oil	212	PAD District IV	PAD District V
1986	Residual Fuel Oil	403	PAD District IV	PAD District V
1987	Residual Fuel Oil	497	PAD District IV	PAD District V
1988	Residual Fuel Oil	305	PAD District IV	PAD District V
1989	Residual Fuel Oil	381	PAD District IV	PAD District V
1990	Residual Fuel Oil	336	PAD District IV	PAD District V
1991	Residual Fuel Oil	378	PAD District IV	PAD District V
1992	Residual Fuel Oil	361	PAD District IV	PAD District V
1996	Residual Fuel Oil	184	PAD District IV	PAD District V
1997	Residual Fuel Oil	100	PAD District IV	PAD District V
1998	Residual Fuel Oil	82	PAD District IV	PAD District V
1999	Residual Fuel Oil	142	PAD District IV	PAD District V
2000	Residual Fuel Oil	224	PAD District IV	PAD District V
2001	Residual Fuel Oil	149	PAD District IV	PAD District II
2001	Residual Fuel Oil	95	PAD District V	PAD District II
2001	Residual Fuel Oil	281	PAD District V	PAD District I
2002	Residual Fuel Oil	33	PAD District V	PAD District III
2002	Residual Fuel Oil	67	PAD District V	PAD District IV
2003	Residual Fuel Oil	228	PAD District V	PAD District III
2004	Residual Fuel Oil	296	PAD District V	PAD District III
2005	LPG	198	PAD District V	PAD District IV

Source: EIA calculations based on data from the State Energy Data System and the *Petroleum Supply Annual*.

Because crude oil consumption is not an individual fuel in SEDS for 1970 through 1980, the small amounts of crude oil that were used at refineries during those years were allocated to residual and distillate fuels consumed at refineries. The allocation from crude oil refinery use to residual and distillate fuels refinery use was made according to each fuel's

share of the total crude oil used directly (including losses) as residual and distillate fuels from the EIA *Petroleum Supply Annual, Volume 1,* of each year, Table 2.

Refinery consumption of still gas, excluding still gas consumed as petrochemical feedstocks, is subtracted from the SEDS industrial sector total for 1970 through 1985. Beginning in 1986, EIA data series no longer report refinery fuel and feedstock use separately, and all industrial still gas consumption is removed.

Refineries' consumption of coal is withheld in the data source for 1999 and 2000 and unpublished estimates developed by the data source office are used for 1999 and 2000. For 2001 and 2002, the U.S. values for refinery consumption of coal are published although the PAD district values are withheld. The PAD district values for 2001 and 2002 are estimated by applying the PAD districts' percentages of the U.S. total in 2000 to the U.S. totals for 2001 and 2002.

Intermediate Products. Aviation gasoline blending components, motor gasoline blending components, natural gasoline (1970 through 1983), pentanes plus (1984 forward), plant condensate (1970 through 1983), unfinished oils, and unfractionated stream (1970 through 1983) are used at refineries and blending plants to make end-use petroleum products, particularly motor gasoline. Accordingly, consumption of these products is completely removed.

Crude Oil Lease, Plant, and Pipeline Fuel. Industrial crude oil is assumed to be used as lease, plant, and pipeline fuel. Because these are process fuel uses, this crude oil is removed from SEDS industrial sector consumption.

Natural Gas Lease and Plant Fuel. Natural gas consumed as lease and plant fuel is process fuel and is subtracted from SEDS industrial sector natural gas totals by State and year.

Natural Gas Pipeline Fuel. Most of the natural gas consumed in the transportation sector of is used to power pipelines. As such, it is a process fuel and is subtracted from SEDS consumption in order to calculate expenditures.

Electricity Exports. Electricity exported to Canada and Mexico are excluded from the calculations of U.S. domestic energy expenditures and U.S. average energy prices.

Electrical System Energy Losses. The amount of energy lost during generation, transmission, and distribution of electricity (including plant use and unaccounted for electrical energy) is process fuel and is subtracted from sectoral energy consumption estimates used in the price and expenditure tables. The energy losses are "paid for" when residential, commercial, industrial, and transportation sector consumers buy the electricity produced by the electric power sector.

Energy Losses and Co-products from the Production of Fuel Ethanol. Fuel ethanol is produced from corn and other biomass inputs that are not included elsewhere as energy sources. The difference in heat content of the feedstock and the fuel ethanol is considered process fuel and is subtracted from sector energy consumption estimates used in the price and expenditure tables.

Data Sources

Capacity of Petroleum Refineries. 1982 forward: EIA, *Petroleum Supply Annual, Volume 1*, http://www.eia.doe.gov/oil_gas/petroleum/data_publications/petroleum_supply_annual/psa_volume1/psa_volume1.html tables titled "Number and Capacity of Operable Petroleum Refineries," columns titled, "Crude Capacity, Barrels per Calendar Day, Operating" (1982–1985), and "Atmospheric Crude Oil Distillation Capacity, Barrels per Calendar Day, Operating" (1986 forward).

1979–1981: EIA, Energy Data Reports, *Petroleum Refineries in the United States and U.S. Territories*, table titled "Number and Capacity of Petroleum Refineries," column heading, "Crude Capacity, Barrels per Calendar Day, Operating."

1978: EIA, Energy Data Reports, *Petroleum Refineries in the United States and Puerto Rico*, table titled "Number and Capacity of Petroleum Refineries," column heading, "Crude Capacity, Barrels per Calendar Day, Operating."

1970–1977: Bureau of Mines, U.S. Department of the Interior, Mineral Industry Surveys, *Petroleum Refineries in the United States and Puerto Rico*, table titled "Number and Capacity of Petroleum Refineries," column heading, "Crude Capacity, Barrels per Calendar Day, Operating."

Fuel Consumed at Refineries. 1981–1994, 1996, and 1998 forward: EIA, *Petroleum Supply Annual, Volume 1*, http://www.eia.doe.gov/oil_gas/petroleum/data_publications/petroleum_supply_annual/psa_volume1/psa_volume1.html table titled "Fuels Consumed at Refineries by PAD District." Data for 1991 are from a separately published an EIA *Errata* dated November 10, 1992, GPO Stock No. 061-003-00758-9.

1995, 1997: EIA, *Petroleum Supply Annual, Volume 1*, table titled "Fuels Consumed at Refineries by PAD District." Data for coal, electricity, and natural gas are not published and values for the previous year are repeated.

1976–1980: EIA, Energy Data Reports, *Crude Petroleum, Petroleum Products, and Natural Gas Liquids*, table titled "Fuels Consumed for All Purposes at Refineries in the United States, by States."

1970–1975: Bureau of Mines, U.S. Department of the Interior, Mineral Industry Surveys, *Crude Petroleum, Petroleum Products, and Natural Gas Liquids*, table titled "Fuels Consumed for All Purposes at Refineries in the United States, by States."

Intermediate Products. 1970 forward: EIA, State Energy Data System, industrial sector consumption estimates for aviation gasoline blending components, crude oil, motor gasoline blending components, natural gasoline (1970–1983), pentanes plus (1984 forward), petroleum coke, plant condensate (1970–1983), still gas (excluding still gas consumed as petrochemical feedstocks, 1970–1985), unfinished oil, and unfractionated stream (1970–1983).

Natural Gas Lease, Plant, and Pipeline Fuel Use. 1997 forward: EIA, Natural Gas Navigator, http://tonto.eia.doe.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm (use drop-down menu to select area, then click on icon that says "Download Series History") and published in the EIA, *Natural Gas Annual*, Tables 26 through 76.

1993–1996: EIA *Historical Natural Gas Annual 1930 Through 2000,* http://www.eia.doe.gov/oil_gas/natural_gas/data_publications/historical_natural_gas_annual/hnga.html Table 15.

1970–1992: EIA *Natural Gas Annual 1994, Volume II,* Table 14.

Residential Wood. 1990 forward: EIA, unpublished data from the "1993 Residential Energy Consumption Survey," Form EIA-457 http://www.eia.doe.gov/emeu/recs/contents.html.

1970–1989: EIA, unpublished data from the "1980 Residential Energy Consumption Survey," Form EIA-457.

Commercial Wood and Waste. 1990 forward: EIA, unpublished data from the "1993 Residential Energy Consumption Survey," Form EIA-457 http://www.eia.doe.gov/emeu/recs/contents.html.

1989 forward: EIA, SEDS, U.S. annual average percentages of wood (WDEISUS) and percentages of waste (WSEISUS) acquired at no cost by the electric power sector.

1970–1989: EIA, unpublished data from the "1980 Residential Energy Consumption Survey," Form EIA-457.

Industrial Wood and Waste. 1994 forward: EIA, unpublished data from the "1994 Manufacturing Energy Consumption Survey" (Form EIA-846) http://www.eia.doe.gov/emeu/mecs/contents.html.

1989 forward: EIA, SEDS, U.S. annual average percentages of wood (WDEISUS) and percentages of waste (WSEISUS) acquired at no cost by the electric power sector.

1970–1993: EIA, unpublished data from the "1991 Manufacturing Energy Consumption Survey" (Form EIA-846).