

## Section 7. Consumption Adjustments for Calculating Expenditures

The State Energy Data System (SEDS) calculates expenditures as the product of the SEDS price estimates and consumption estimates. The prices estimated by SEDS are end-use prices for the final products purchased by end users and the cost of fuels consumed by the electric power sectors. For the SEDS expenditure calculations, SEDS adjusts its consumption estimates to remove process fuel, intermediate products, and other consumption that has no direct fuel costs to the end-use customer, including: hydroelectric, geothermal, solar, and wind energy sources, and some wood and waste. SEDS also excludes electricity exports to Canada and Mexico from the expenditure calculations.

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 end users, called “process fuel.” Common examples include: energy used to drill for oil and gas, to transport petroleum and natural gas by pipeline, and to generate and deliver electricity to end users. Energy products that are later used in another energy product for end-use consumption are called “intermediate products.” A common example is intermediate motor gasoline blending components that are later consumed as part of finished motor gasoline sold at gas stations.

Process fuel and intermediate products are not directly purchased by the end user and, therefore, SEDS does not estimate these prices. Although the end user does not consume either process fuel or intermediate products directly, the cost is passed on to the end user in the final end-use product price. If SEDS did not remove the process fuel and intermediate products consumption, there would be double counting, first as paid by the “processor” (producer, processor, or transporter) and again in the final price to the end user.

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

*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 and distribution 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 biodiesel and fuel ethanol

*Intermediate product consumption adjustments include:*

1. Aviation gasoline blending components
2. Motor gasoline blending components
3. Natural gasoline (1970 through 1983)
4. Natural gasoline, formerly pentanes plus (1984 through 2009)
5. Plant condensate (1970 through 1983)
6. Unfinished oils
7. Unfractionated streams (1970 through 1983)

For 1984 forward, the U.S. Energy Information Administration (EIA) reports historical natural gasoline (including isopentane) and plant condensate together as pentanes plus. In the 2016 SEDS cycle, EIA renamed the product natural gasoline and EIA now includes it as part of a group of products called hydrocarbon gas liquids (HGL). For 2010 forward, SEDS includes the price of natural gasoline consumed by the petrochemical industry in the aggregate price for HGL. Before 2010, SEDS assumes natural gasoline to be an intermediate product with no end-use price or expenditures.

*Renewable energy consumption adjustments include:*

1. Solar energy in the residential, commercial, industrial, and electric power sectors;
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
- Electricity generated from wind energy in the commercial, industrial, and electric power sectors; and
  - 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 SEDS does remove the consumption of supplemental gaseous fuels (SGF) 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 therefore SEDS does not adjust those products in its expenditure calculations.

Table TN7.1 shows the quantities of energy, by state, removed from SEDS consumption to calculate expenditures for the most recent year. Table TN7.2 shows the adjustments made to SEDS U.S. consumption estimates to derive the net consumption data used to calculate expenditures for 1970 forward.

State adjustment estimates from 1970 forward are available in the SEDS Internet data file, [http://www.eia.gov/state/seds/sep\\_update/pr\\_adjust\\_consum\\_update.csv](http://www.eia.gov/state/seds/sep_update/pr_adjust_consum_update.csv).

### *Adjustment procedures*

**Hydroelectricity, geothermal, solar, and wind energy.** Electricity generated from hydropower and geothermal, solar, and wind 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, SEDS removes consumption of these renewable sources for electricity generation from its expenditure calculations. Direct use of geothermal and solar thermal energy also have no fuel costs and SEDS omits them from its energy expenditure calculations.

**Residential wood.** Some residential wood is purchased and some is acquired at no cost. For 1970 through 1989, based on responses to the Form EIA-457, "1980 Residential Energy Consumption Survey," SEDS developed Census division-level ratios of wood purchased and applied to residential wood consumption in each state in the divisions. For 1990 forward, SEDS uses the Census region ratios from Form EIA-457, "1993 Residential Energy Consumption Survey." Table TN7.3 shows the percentage of purchased wood for each Census division or region.

**Commercial wood and waste.** Some commercial wood and waste are purchased and some are acquired at no cost. SEDS estimates the ratios of

conventional commercial wood purchased using the same percentages used for the residential sector (see Table TN7.3). For 1989 through 2011, SEDS estimates the ratios of wood and waste acquired at no cost by commercial combined heat-and-power facilities using the U.S. annual average percentages of wood and waste acquired at no cost by the electric power sector. For 2012 forward, because of lack of information, SEDS no longer estimates these ratios and assumes that all commercial wood and waste to be purchased.

**Industrial wood and waste.** The cost of industrial wood and waste products used for energy vary widely from more expensive woods to free waste products. SEDS estimates industrial wood and waste consumption for two categories—manufacturing industries and combined heat and power (CHP) facilities—to estimate the amount of wood and waste used at no cost.

For 1994 forward, SEDS adjusts manufacturing wood and waste consumption using data from Form EIA-846, "1994 Manufacturing Energy Survey (MECS)." For 1980 through 1993, SEDS uses Form EIA-846, "1991 Manufacturing Energy Survey." For 1970 through 1979, SEDS uses 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. SEDS uses the two quantity series to calculate SIC category average ratios of wood and waste obtained at no cost. SEDS applies these SIC ratios to the estimated consumption for each category in each state to estimate the state's manufacturing wood and waste consumption at no cost.

For 1989 through 2011, SEDS estimates the amount of wood and waste consumed at no cost by industrial CHP facilities using the U.S. annual average percentages of wood and waste used at no cost by the electric power sector. For 2012 forward, because of lack of information, SEDS no longer estimates these ratios and assumes all industrial CHP wood and waste consumption to be purchased.

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.** SEDS estimates petroleum refinery consumption of distillate fuel, residual fuel, hydrocarbon gas liquids (mainly propane), petroleum coke, still gas, natural gas, steam coal, and electricity for each state and subtracts it from the state's industrial sector total of each energy source.

The SEDS estimation method for petroleum coke consumption by refineries is described in Section 4 of the SEDS Consumption Technical Notes at <http://www.eia.gov/state/seds/seds-technical-notes-complete.php>.

**Table TN7.1. Energy consumption adjustments for calculating expenditures by state, 2019 (billion Btu)**

State	Refinery Fuel and Intermediate Products								Total
	Distillate Fuel Oil	Residual Fuel Oil	Hydrocarbon gas liquids <sup>a</sup>	Petroleum Coke	Other Petroleum <sup>b</sup>	Natural Gas <sup>c</sup>	Coal	Electricity <sup>d</sup>	
AK	46	—	—	—	14,609	3,319	—	215	18,189
AL	12	—	8	—	12,421	10,131	—	1,129	23,701
AR	12	—	4	1,358	8,052	6,476	—	734	16,635
AZ	—	—	—	—	—	—	—	—	—
CA	507	—	1,521	62,543	169,866	155,976	—	8,114	398,527
CO	12	—	58	3,125	9,164	5,141	—	1,324	18,823
CT	—	—	—	—	—	—	—	—	—
DC	—	—	—	—	—	—	—	—	—
DE	—	—	8	8,506	16,211	12,227	—	972	37,924
FL	—	—	—	—	—	—	—	—	—
GA	—	—	—	—	—	—	—	—	—
HI	40	—	—	—	13,124	—	—	191	13,355
IA	—	—	—	—	—	—	—	—	—
ID	—	—	—	—	—	—	—	—	—
IL	63	31	3,445	29,700	91,364	39,455	—	11,253	175,312
IN	29	13	119	13,743	41,266	18,148	—	4,917	78,235
KS	23	13	104	7,450	35,928	22,865	—	4,036	70,419
KY	17	—	77	7,412	25,891	11,357	—	3,084	47,839
LA	328	—	154	91,809	299,545	141,643	—	31,837	565,317
MA	—	—	—	—	—	—	—	—	—
MD	—	—	—	—	—	—	—	—	—
ME	—	—	—	—	—	—	—	—	—
MI	12	6	35	3,137	12,456	5,509	—	1,484	22,639
MN	29	13	111	9,198	38,971	17,118	—	4,644	70,082
MO	—	—	—	—	—	—	—	—	—
MS	40	—	19	5,677	35,050	28,590	—	3,187	72,563
MT	23	—	119	6,903	18,987	8,922	—	3,467	38,421
NC	—	—	—	—	—	—	—	—	—
ND	6	—	23	2,182	8,008	3,695	—	955	14,869
NE	—	—	—	—	—	—	—	—	—
NH	—	—	—	—	—	—	—	—	—
NJ	—	—	15	19,773	37,236	28,014	—	2,231	87,269
NM	12	—	8	2,716	12,189	9,975	—	1,109	26,009
NV	—	—	—	—	178	43	—	3	224
NY	—	—	—	—	—	—	—	—	—
OH	40	19	154	16,485	53,544	22,917	—	6,363	99,522
OK	35	19	134	11,474	46,516	27,969	—	5,388	91,534
OR	—	—	—	—	—	—	—	—	—
PA	—	31	15	12,084	38,570	19,343	—	4,200	74,244
RI	—	—	—	—	—	—	—	—	—
SC	—	—	—	—	—	—	—	—	—
SD	—	—	—	—	—	—	—	—	—
TN	12	6	46	4,992	16,015	6,983	—	1,907	29,961
TX	651	6	1,463	163,952	519,951	311,029	—	48,372	1,045,424
UT	23	—	111	4,986	18,125	8,811	—	1,723	33,779
VA	—	—	—	—	—	—	—	—	—
VT	—	—	—	—	—	—	—	—	—
WA	173	—	519	14,202	57,984	36,500	—	5,719	115,096
WI	—	—	—	805	—	—	—	—	805
WV	—	—	—	—	1,984	1,558	—	119	3,661
WY	17	—	92	5,639	14,992	8,371	—	2,167	31,278
US	2,160	157	8,362	509,851	1,668,198	972,084	—	160,845	3,321,656

See footnotes at end of table.

**Table TN7.1. Energy consumption adjustments for calculating expenditures by state, 2019 (billion Btu) (continued)**

State	Residential		Commercial		Industrial					Transportation	Electrical System Energy Losses	Total
	Non-combustible Renewable Energy <sup>e</sup>	Wood	Non-combustible Renewable Energy <sup>e</sup>	Wood and Waste	Crude Oil Lease, Plant, and Pipeline Fuel	Natural Gas Lease and Plant Fuel	Non-combustible Renewable Energy <sup>e</sup>	Wood and Waste	Biofuels Production Losses <sup>f</sup>	Natural Gas Pipeline Fuel		
AK .....	130	3,205	1,256	464	—	281,732	—	40	—	344	35,204	340,565
AL .....	202	1,205	88	174	—	13,481	51	28,364	20	23,758	536,879	627,922
AR .....	1,055	4,201	173	608	—	3,369	42	12,958	117	7,646	299,693	346,496
AZ .....	19,423	3,161	6,957	457	—	4	370	982	1,126	15,896	494,869	543,246
CA .....	102,020	15,659	34,450	2,265	—	41,239	20,972	11,025	9,896	21,206	1,489,488	2,146,746
CO .....	4,219	7,692	2,452	1,113	—	90,214	313	279	6,969	10,708	379,290	522,072
CT .....	4,097	2,638	2,014	382	—	—	266	3,006	32	6,715	158,337	177,488
DC .....	415	—	448	—	—	—	—	—	—	1,964	76,576	79,404
DE .....	1,195	407	361	59	—	—	73	15	—	589	67,330	107,953
FL .....	40,348	184	3,369	27	—	267	115	6,873	13	17,152	1,289,725	1,358,071
GA .....	820	1,731	402	250	—	—	2,347	24,550	5,933	5,842	878,950	920,826
HI .....	8,028	13	3,879	2	—	—	561	39	7	—	56,662	82,546
IA .....	1,077	3,820	1,661	553	—	—	46	8,363	221,376	12,570	337,770	587,235
ID .....	596	9,146	666	1,323	—	76	794	1,127	3,330	7,637	146,940	171,635
IL .....	4,057	4,275	1,012	618	—	765	3	3,917	74,990	29,361	1,009,325	1,303,637
IN .....	4,460	8,843	1,466	1,279	—	325	26	11,083	53,448	11,568	737,675	908,407
KS .....	536	2,789	959	403	—	11,929	—	104	27,236	24,456	293,658	432,490
KY .....	2,079	6,259	1,048	905	—	5,235	11	7,415	1,870	14,892	536,345	623,899
LA .....	3,038	346	998	50	—	223,148	43	21,577	—	163,966	511,667	1,490,150
MA .....	7,115	3,996	12,400	578	—	—	861	2,373	1	10,166	329,775	367,264
MD .....	6,668	3,354	2,451	485	—	—	320	603	—	26,146	406,749	446,774
ME .....	623	8,715	283	1,261	—	—	1,003	7,443	1	1,201	58,872	79,401
MI .....	5,312	25,410	1,351	3,676	—	6,010	112	15,719	17,373	29,704	693,522	820,827
MN .....	1,807	14,326	529	2,072	—	—	962	5,274	63,954	13,043	400,800	572,849
MO .....	1,750	13,327	1,205	1,928	—	—	54	3,323	14,335	7,987	562,426	606,334
MS .....	239	958	810	139	—	2,072	47	1,921	79	26,888	263,841	369,556
MT .....	287	8,125	207	1,175	—	4,219	70	659	—	3,470	110,366	166,999
NC .....	2,512	5,408	2,199	782	—	—	65	10,420	3	2,766	884,626	908,780
ND .....	541	394	447	57	—	43,680	—	898	26,436	19,124	158,579	265,024
NE .....	602	2,107	765	305	—	74	8	248	106,295	7,429	229,903	347,734
NH .....	827	5,314	364	769	—	—	68	1,989	4	165	74,403	83,902
NJ .....	11,315	1,050	10,358	152	—	—	1,460	319	—	7,686	449,118	568,725
NM .....	2,146	7,562	878	1,094	—	92,612	253	73	—	12,486	163,905	307,017
NV .....	6,157	1,556	6,278	225	—	2	775	67	—	4,367	197,183	216,834
NY .....	11,042	13,966	8,013	2,020	—	181	750	11,826	7,459	26,076	856,321	937,654
OH .....	3,345	14,541	1,951	2,103	—	22,912	872	5,361	31,769	31,438	948,581	1,162,397
OK .....	180	2,634	42	381	—	116,368	5	11,628	56	56,254	366,852	645,935
OR .....	2,882	15,632	1,459	2,261	—	21	306	14,480	1,912	5,972	273,156	318,083
PA .....	4,462	13,182	2,320	1,907	—	257,416	628	24,967	5,501	42,606	885,193	1,312,426
RI .....	611	687	1,158	99	—	—	—	52	7	2,113	35,764	40,492
SC .....	2,664	996	730	144	—	—	270	21,170	—	2,250	567,835	596,060
SD .....	662	1,484	971	215	—	25	251	714	61,077	7,067	80,490	152,955
TN .....	478	4,561	639	660	—	289	57	7,496	9,124	11,154	685,312	749,731
TX .....	8,921	1,635	3,574	236	—	503,683	100	10,169	15,567	161,970	2,677,250	4,428,530
UT .....	3,382	2,461	1,141	356	—	19,591	439	97	—	13,218	205,236	279,699
VA .....	2,189	7,426	1,227	1,074	—	6,534	17	9,600	202	13,750	733,617	775,636
VT .....	956	5,726	508	828	—	—	20	117	—	3	5,297	13,456
WA .....	2,042	18,340	1,042	2,653	—	—	5	11,991	134	13,866	563,753	728,921
WI .....	1,262	19,928	556	2,883	—	—	1,237	28,049	31,849	4,186	456,220	546,973
WV .....	157	5,800	37	839	—	103,290	5,015	571	—	25,987	232,120	377,479
WY .....	131	2,465	548	357	—	53,606	69	50	—	13,927	124,017	226,447
US .....	291,061	308,640	130,098	44,646	—	1,904,369	42,133	351,379	799,503	980,732	24,017,465	32,191,682

<sup>a</sup> Mainly propane consumed as refinery fuel.

<sup>b</sup> In this table, "other petroleum" consists of: still gas consumed as refinery fuel; and aviation gasoline blending components and motor gasoline blending components used as intermediate products.

<sup>c</sup> Natural gas including supplemental gaseous fuels.

<sup>d</sup> Electricity is converted at the rate of 3,412 Btu per kilowatthour.

<sup>e</sup> Hydroelectric power, geothermal, solar, and wind energy. Solar thermal energy consumed as heat by the commercial and industrial sectors that cannot be separately identified are included in residential consumption.

<sup>f</sup> Energy losses and co-products from the production of biodiesel and fuel ethanol.

— = No consumption. NA = Not available.

Source: EIA, State Energy Data System.

**Table TN7.2. Energy consumption adjustments for calculating expenditures, selected years, 1970 through 2019 (trillion Btu)**

Year	Total (Gross) Consumption	Adjustments													Consumption used in Expenditure Calculations <sup>c</sup>
		Residential		Commercial		Industrial						Transportation	Electrical System Energy Losses	Total	
		Non-combustible Renewable Energy <sup>a</sup>	Wood	Non-combustible Renewable Energy <sup>a</sup>	Wood and Waste	Refinery Fuel and Intermediate Products	Crude Oil Lease, Plant, and Pipeline Fuel	Natural Gas Lease and Plant Fuel	Non-combustible Renewable Energy <sup>a</sup>	Wood and Waste	Biofuels Production Losses <sup>b</sup>	Natural Gas Pipeline Fuel			
1970	67,720	—	298	—	6	2,714	—	1,442	34	789	—	740	11,497	17,520	50,200
1975	71,953	—	316	—	6	2,881	—	1,434	32	824	—	595	14,304	20,392	51,561
1980	78,048	—	627	—	16	3,051	—	1,058	33	1,283	—	650	17,178	23,896	54,303
1981	76,094	—	651	—	16	2,203	—	959	33	1,354	6	660	17,161	23,042	53,225
1982	73,006	—	724	—	16	2,087	—	1,144	33	1,310	16	614	16,835	22,779	50,371
1983	72,879	—	722	—	16	2,120	140	1,010	33	1,480	29	505	17,262	23,318	49,692
1984	76,511	—	733	—	16	2,254	135	1,113	33	1,510	35	545	17,790	24,165	52,456
1985	76,407	—	755	—	18	2,045	128	1,001	33	1,503	42	521	18,164	24,211	52,321
1986	76,592	—	688	—	20	2,285	103	954	33	1,478	48	501	18,135	24,246	52,458
1987	78,960	—	634	—	22	2,485	72	1,194	33	1,472	55	538	18,558	25,063	53,996
1988	82,711	—	676	—	24	2,695	85	1,134	33	1,531	55	633	19,478	26,346	56,464
1989	84,732	57	684	3	73	2,710	59	1,103	30	684	56	650	20,850	26,957	57,879
1990	84,455	60	337	4	59	2,802	51	1,269	33	716	49	682	21,255	27,318	57,255
1991	84,379	62	353	5	60	2,668	39	1,164	32	685	56	621	21,444	27,189	57,296
1992	85,732	65	371	5	66	2,954	27	1,208	33	689	64	608	21,309	27,398	58,446
1993	87,295	67	308	5	68	2,877	21	1,199	32	642	74	643	22,097	28,033	59,375
1994	89,011	68	292	5	66	2,991	19	1,153	65	662	82	706	22,400	28,510	60,606
1995	90,995	69	292	6	66	2,915	15	1,253	58	445	86	723	23,214	29,141	61,959
1996	94,005	70	303	7	77	3,204	14	1,280	64	495	61	734	23,916	30,226	63,884
1997	94,656	70	233	7	80	3,197	5	1,251	61	493	80	781	24,167	30,425	64,330
1998	94,933	69	207	9	71	3,043	—	1,212	58	493	86	657	25,102	31,007	64,022
1999	96,526	69	213	9	66	3,051	—	1,103	53	495	90	663	25,689	31,500	65,119
2000	98,695	66	229	9	67	2,951	—	1,181	47	459	99	661	26,405	32,174	66,606
2001	96,039	65	210	10	46	3,152	—	1,139	37	437	108	641	25,663	31,507	64,611
2002	97,542	63	213	10	43	3,028	—	1,135	44	312	130	683	26,210	31,871	65,733
2003	97,835	65	225	13	46	3,141	—	1,147	46	316	168	609	26,111	31,887	66,012
2004	100,014	65	230	14	46	3,123	—	1,123	37	537	201	582	26,601	32,558	67,510
2005	100,109	66	249	16	49	3,130	—	1,138	37	336	227	601	27,144	32,994	67,162
2006	99,388	71	221	18	46	3,211	—	1,171	34	278	280	602	26,902	32,832	66,584
2007	100,916	77	244	19	46	3,180	—	1,257	21	293	369	640	27,536	33,683	67,261
2008	98,765	85	273	21	47	2,983	—	1,250	23	282	519	667	27,239	33,390	65,420
2009	93,969	93	292	25	48	2,922	—	1,304	24	457	603	689	25,809	32,266	61,791
2010	<sup>R</sup> 97,513	102	313	32	45	2,972	—	1,316	23	392	727	692	26,826	33,438	<sup>R</sup> 64,164
2011	<sup>R</sup> 96,867	110	304	41	45	3,052	—	1,355	26	370	756	705	26,516	33,281	<sup>R</sup> 63,672
2012	<sup>R</sup> 94,363	118	254	54	34	3,105	—	1,433	34	357	711	751	25,545	32,396	<sup>R</sup> 62,055
2013	<sup>R</sup> 97,101	131	332	62	40	3,175	—	1,522	46	361	709	857	25,665	32,899	<sup>R</sup> 64,254
2014	<sup>R</sup> 98,270	149	336	74	42	3,070	—	1,562	28	370	757	726	25,803	32,915	<sup>R</sup> 65,413
2015	<sup>R</sup> 97,364	168	288	78	42	3,057	—	1,633	32	369	776	707	25,076	32,226	<sup>R</sup> 65,193
2016	<sup>R</sup> 97,331	201	<sup>R</sup> 252	85	45	3,242	—	1,599	36	366	801	715	<sup>R</sup> 24,906	<sup>R</sup> 32,246	<sup>R</sup> 65,137
2017	<sup>R</sup> 97,602	233	<sup>R</sup> 242	99	44	3,290	—	<sup>R</sup> 1,632	40	366	821	751	24,552	<sup>R</sup> 32,071	<sup>R</sup> 65,592
2018	<sup>R</sup> 101,162	<sup>R</sup> 260	<sup>R</sup> 297	118	45	3,293	—	<sup>R</sup> 1,743	40	<sup>R</sup> 355	824	<sup>R</sup> 910	<sup>R</sup> 25,015	<sup>R</sup> 32,901	<sup>R</sup> 68,324
2019	100,266	291	309	130	45	3,322	—	1,904	42	351	800	981	24,017	32,192	68,130

<sup>a</sup> Hydroelectric power, geothermal, solar, and wind energy. Solar thermal energy consumed as heat by the commercial and industrial sectors that cannot be separately identified are included in residential consumption.

<sup>b</sup> Energy losses and co-products from the production of biodiesel and fuel ethanol.

<sup>c</sup> Includes adjustments of supplemental gaseous fuels and processed fuels not shown on this table.

Where shown, R = Revised data and — = No consumption.

NA = Not available.

Note: Totals may not equal sum of components due to independent rounding. • All data are available via the full-precision data file (CSV) at <http://www.eia.gov/state/seds/seds-data-fuel.php?sid=US>.

Sources: EIA, State Energy Data System.

**Table TN7.3. Percentage of purchased wood in residential wood consumption**

1960–1989 Census Division	Percent	1990 forward Census Region	Percent
New England	40%	Northeast	61%
Middle Atlantic	29%	Midwest	32%
East North Central	18%	South	39%
West North Central	17%	West	42%
South Atlantic	30%		
East South Central	18%		
West South Central	38%		
Mountain	12%		
Pacific	31%		

For 1970 through 1985, SEDS subtracts refinery consumption of still gas, excluding still gas consumed as petrochemical feedstocks, from the SEDS industrial sector total. For 1986 forward, EIA no longer reports refinery fuel and feedstock use separately, and SEDS removes all industrial still gas consumption for the expenditure calculations. The SEDS estimation method for still gas consumption is described in Section 4 of the SEDS Consumption Technical Notes at <http://www.eia.gov/state/seds/seds-technical-notes-complete.php>.

Refinery consumption of each of the other fuels is available in the data sources by state or group of states (1970 through 1980) and by Petroleum Administration for Defense (PAD) district (1981 forward). For 2013 forward, SEDS incorporates unpublished state-level refinery fuel consumption data that satisfied two statistical disclosure rules—that there are at least three refineries not of the same company in the state and that no one refinery uses more than 60% of the particular fuel. The number of states with usable data varies by fuel, from zero for coal and residual fuel oil to over 10 for electricity.

For each fuel, SEDS subtracts consumption for all the usable states within each PAD district from the district’s fuel consumption. SEDS allocates the remainder to the other states in the district proportionally to their operable refining capacities. To reduce the possibility of over-allocating refinery fuel use to states that do not consume much of the fuel, SEDS does not include states where industrial sector consumption of a specific fuel is less than 0.05% (for natural gas, electricity, distillate fuel oil, and propane) or 0.1% (for coal and residual fuel oil) of the U.S. industrial sector total consumption in the allocation.

Before 2013, except for a few states with data in the earlier years, refinery

fuel consumption is available at the regional level. SEDS estimates state-level refinery consumption of each of the other fuels by allocating the regional data (for state groups before 1981 and PAD district for 1981 through 2012) to the states with operating refineries proportionally to their shares of the region’s industrial sector consumption of the fuel.

In some cases, the estimated state refinery fuel consumption of residual fuel or hydrocarbon gas liquids exceeds the estimate of the state’s total industrial sector consumption of that fuel. For 1970 through 2006, SEDS reduces the refinery fuel consumption for the PAD district, group of states, or individual state until each state has positive industrial consumption. Then, SEDS reallocates the excess refinery fuel to a different PAD district, group of states, or individual state as shown in Table TN7.4. When this adjustment involves a PAD district or group value, SEDS recalculates the refineries’ consumption estimates for all states within the PAD district or group using these new values. For 2007 forward, SEDS no longer makes this adjustment.

The data source withholds refinery consumption of coal for 1999 and 2000, and SEDS uses unpublished estimates developed by the data source office for 1999 and 2000. For 2001 and 2002, the data source publishes U.S. values for refinery consumption of coal, but withholds the PAD district values. SEDS estimates the PAD district values for 2001 and 2002 by applying the PAD districts’ shares of the U.S. total in 2000 to the U.S. totals for 2001 and 2002.

Because crude oil consumption is not an individual fuel in SEDS for 1970 through 1980, SEDS allocates the small amounts of crude oil used at refineries during those years to residual and distillate fuels consumed at refineries. SEDS allocates the crude oil refinery use to residual and distillate fuels refinery use proportionally to each fuel’s share of the total crude oil used directly (including losses) as residual and distillate fuels in EIA’s *Petroleum Supply Annual*, Volume 1, Table 2.

**Intermediate products.** Aviation gasoline blending components, motor gasoline blending components, natural gasoline (1970 through 1983), plant condensate (1970 through 1983), unfinished oils, and unfractionated streams (1970 through 1983) are used at refineries and blending plants to make end-use petroleum products, such as finished motor gasoline. SEDS removes the consumption of these products for the expenditure calculations. Through 2009, SEDS assumes natural gasoline (formerly pentanes plus) to be an intermediate product and removes its consumption for the expenditures calculations.

**Crude oil lease, plant, and pipeline fuel.** SEDS assumes all industrial crude oil to be used as lease, plant, and pipeline fuel. Because these are process fuel uses, SEDS removes crude oil consumption for the expenditures calculations.

**Table TN7.4. Reallocations of excess refinery fuel consumption, 1970 through 2005**

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	HGL (propane)	173	Montana	Wyoming
1985	Residual Fuel Oil	212	PAD District 4	PAD District 5
1986	Residual Fuel Oil	403	PAD District 4	PAD District 5
1987	Residual Fuel Oil	497	PAD District 4	PAD District 5
1988	Residual Fuel Oil	305	PAD District 4	PAD District 5
1989	Residual Fuel Oil	381	PAD District 4	PAD District 5
1990	Residual Fuel Oil	336	PAD District 4	PAD District 5
1991	Residual Fuel Oil	378	PAD District 4	PAD District 5
1992	Residual Fuel Oil	361	PAD District 4	PAD District 5
1996	Residual Fuel Oil	184	PAD District 4	PAD District 5
1997	Residual Fuel Oil	100	PAD District 4	PAD District 5
1998	Residual Fuel Oil	82	PAD District 4	PAD District 5
1999	Residual Fuel Oil	142	PAD District 4	PAD District 5
2000	Residual Fuel Oil	224	PAD District 4	PAD District 5
2001	Residual Fuel Oil	149	PAD District 4	PAD District 2
2001	Residual Fuel Oil	95	PAD District 5	PAD District 2
2001	Residual Fuel Oil	281	PAD District 5	PAD District 1
2002	Residual Fuel Oil	33	PAD District 5	PAD District 3
2002	Residual Fuel Oil	67	PAD District 5	PAD District 4
2003	Residual Fuel Oil	228	PAD District 5	PAD District 3
2004	Residual Fuel Oil	296	PAD District 5	PAD District 3
2005	HGL (propane)	198	PAD District 5	PAD District 4

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

**Natural gas lease and plant fuel.** Natural gas consumed as lease and plant fuel is process fuel and SEDS removes it for the expenditures calculations.

**Natural gas for pipeline and distribution use.** Most of the natural gas consumed in the transportation sector is used to power pipelines. As such, it is a process fuel and SEDS removes it for the expenditures calculations.

**Electricity exports.** SEDS excludes electricity exported to Canada and Mexico from its 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 SEDS removes it from the sector 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 biofuels.** Fuel ethanol and biodiesel are produced from corn, vegetable oils, animal fats, and other biomass inputs that are not included elsewhere as energy sources. The difference in heat content of the feedstock and biofuels is considered process fuel and SEDS removes it from sector energy consumption estimates used in the price and expenditure tables.

*Data sources*

**Capacity of petroleum refineries.** 1982 forward: EIA, *Refinery Capacity Report*, <http://www.eia.gov/petroleum/refinerycapacity/> or *Petroleum Supply Annual, Volume 1*, <http://www.eia.gov/petroleum/supply/annual/volume1/> tables titled “Number and Capacity of Operable Petroleum Refineries,” columns titled, “Crude Capacity, Barrels per Calendar Day, Operating” (1982-1985), “Atmospheric Crude Oil Distillation Capacity, Barrels per Calendar Day, Operating” (1986-2012), and “Atmospheric Crude Oil Distillation Capacity, Barrels per Calendar Day, Total” (2013 forward), adjusted with information on “New, Shutdown and Activated Refineries” (2011 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.** 2013 forward: EIA unpublished data on fuels consumed at refineries for selected states.

1981-1994, 1996, and 1998 forward: EIA, *Petroleum Supply Annual, Volume 1*, <http://www.eia.gov/petroleum/supply/annual/volume1/> table titled “Fuels Consumed at Refineries by PAD District.” Data for 1991 are from a separately published 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), natural gasoline (formerly pentanes plus) (1984 through 2009), petroleum coke, plant condensate (1970-1983), still gas (excluding still gas consumed as petrochemical feedstocks, 1970-1985), unfinished oils, and unfractionated streams (1970-1983).

**Natural gas lease, plant, and pipeline fuel use.** 1997 forward: EIA, *Natural Gas Annual*, Tables 26 through 76. Also available at [http://www.eia.gov/dnav/ng/ng\\_cons\\_sum\\_dcu\\_nus\\_a.htm](http://www.eia.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm).

1993-1996: EIA *Historical Natural Gas Annual 1930 Through 2000*, [http://www.eia.gov/oil\\_gas/natural\\_gas/data\\_publications/historical\\_natural\\_gas\\_annual/hnga.html](http://www.eia.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.gov/consumption/residential/index.php>.

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.gov/consumption/residential/index.php>.

1989-2011: EIA, SEDS, U.S. annual average percentages of wood and percentages of waste acquired at no cost by the electric power sector. See data sources for estimating wood and waste prices for the electric power sector in Section 5.

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.gov/consumption/manufacturing/>.

1989-2011: EIA, SEDS, U.S. annual average percentages of wood and percentages of waste acquired at no cost by the electric power sector. See data sources for estimating wood and waste prices for the electric power sector in Section 5.

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