

Table
Number **Table Name**

(Click on the table number to go to corresponding table)
 (To return to this "Titles" sheet, you must select this sheet again)

17.01	Consumption of Energy, by Source (Physical Units): 1960 to 2000
17.02	Consumption of Energy, by Source (Trillion BTU): 1960 to 2000
17.03	Consumption of Energy by End-Use Sector (Trillion BTU): 1960 to 2000
17.04	Primary Energy Consumption and Electricity Sales, Total and Per Capita: 1991 to 2000
17.05	Primary Energy Consumption, by Source: 1988 to 2000
17.06	Electricity Generation by Source: 1989 to 1998
17.07	Electricity Production, by Source, by Islands: 1998
17.08	Expenditures for Fuels and Electricity, by Source: 1991 to 2000
17.09	Electric Utilities: 1992 to 2003
17.10	Electric Utilities, by Islands: 2003
17.11	Gas Utilities: 1992 to 2003
17.12	Gas Utilities, by Islands: 2003
17.13	Service Provided by Hawaiian Electric Company, Inc., on Oahu: 1991 to 2003
17.14	Service Provided by the Gas Company, Inc., on Oahu: 1991 to 2003
17.15	Liquid Fuel Tax Base: 1991 to 2003
17.16	Liquid Fuel Tax Base, by Counties: 2003
17.17	Gasoline Service Stations with Payroll, by Counties
17.18	Boilers and Pressure Vessels, by Islands: 2002 and 2003
17.19	Federal Obligations for Research and Development and for R&D Plant in Hawaii: 1996 to 2001
17.20	Characteristics of the Private Technology Sector
17.21	Share of Technology Sector Jobs, by County: 1999 and 2001
17.22	Research and Non-Research Extramural Funding, for the University of Hawaii: 1991-92 to 2002-03
17.23	Research and Development Expenditures at Doctorate-Granting Institutions: Fiscal Years 1991 to 2001
17.24	Patents Issued to Hawaii Residents: 1980 to 2001
17.25	Astronomy and Related Facilities at the Summits of Mauna Kea and Haleakala: 2002

**Table 17.01-- CONSUMPTION OF ENERGY, BY SOURCE
(PHYSICAL UNITS): 1960 TO 2000**

Year	Coal 1/ (1,000 short tons)	Natural gas 2/ (billion cubic feet)	Petroleum (1,000 barrels)	Hydroelectric power 3/ (million kWh)
1960	0	0	16,844	27
1965	0	0	22,478	105
1970	0	0	34,105	108
1975	0	0	37,097	89
1980	0	3	43,562	86
1985	46	2	40,091	86
1986	16	2	39,000	78
1987	63	3	39,763	82
1988	50	3	46,185	81
1989	32	3	48,005	56
1990	4/ 29	3	48,714	4/ 5/ 80
1991	4/ 45	3	45,606	71
1992	4/ 303	3	44,439	61
1993	4/ 691	3	38,814	56
1994	4/ 704	3	41,396	4/ 139
1995	4/ 895	3	40,947	98
1996	4/ 930	3	38,811	4/ 104
1997	4/ 912	3	37,134	115
1998	4/ 843	3	38,159	121
1999	4/ 801	3	37,031	4/ 115
2000	816	3	38,501	103

1/ The continuity of these data series estimates may be affected by changing data sources and estimation methodologies.

2/ Includes supplemental gaseous fuels.

3/ If applicable, through 1988, includes all net imports of electricity, and, from 1989, includes only the portion of imports of electricity that is derived from hydroelectric power.

4/ Data have been revised from previous *Data Book*.

5/ There is a discontinuity between 1988 and 1989 due to the expanded coverage of renewable energy sources beginning in 1989.

Source: U.S. Department of Energy, Energy Information Administration, *State Energy Data Report 2000* <http://www.eia.doe.gov/emeu/states/sep_use/total/pdf/use_all.pdf> table 7 accessed August 11, 2003.

**Table 17.02-- CONSUMPTION OF ENERGY, BY SOURCE
(TRILLION BTU): 1960 TO 2000**

Year	Coal 1/	Natural gas 2/	Petroleum	Hydro-electric power 3/	Wood and waste 1/	Other 1/ 4/	Total 5/
1960	0.0	0.0	94.6	0.3	0.0	0.0	94.9
1965	0.0	0.0	129.3	1.1	0.2	0.0	130.6
1970	0.0	0.0	195.4	1.1	0.4	0.0	197.0
1975	0.0	0.0	212.9	0.9	0.6	0.0	214.4
1980	0.0	3.0	249.6	0.9	11.9	0.0	265.4
1985	1.1	2.7	232.6	0.9	14.2	0.4	251.9
1986	0.4	2.7	227.3	0.8	6.7	0.4	238.3
1987	1.6	2.8	231.0	0.9	6.7	0.3	243.2
1988	1.2	2.8	269.6	0.8	7.0	0.3	281.8
1989	0.8	2.9	280.0	6/ 0.6	6/ 19.6	6/ 1.3	6/ 305.2
1990	0.7	3.0	284.4	7/ 0.8	6/ 22.2	6/ 7/ 1.1	6/ 7/ 312.2
1991	6/ 1.1	2.9	265.6	0.7	6/ 21.7	1.4	6/ 293.3
1992	6/ 6.8	2.9	258.8	0.6	6/ 21.3	1.3	6/ 291.6
1993	6/ 15.6	2.8	224.0	0.6	6/ 20.9	6/ 4.5	6/ 268.4
1994	6/ 15.7	2.9	237.2	6/ 1.4	6/ 18.0	6/ 5.2	6/ 280.5
1995	6/ 19.9	2.9	234.7	1.0	6/ 17.2	6.3	6/ 282.0
1996	6/ 20.4	2.8	221.4	1.1	16.0	6/ 6.6	6/ 268.2
1997	6/ 20.0	2.7	213.7	1.2	6/ 15.4	6/ 6.6	6/ 259.7
1998	6/ 18.7	2.8	218.9	6/ 1.2	6/ 14.3	6.5	6/ 262.4
1999	6/ 17.7	2.9	213.7	1.2	6/ 14.7	6.0	6/ 256.2
2000	17.7	3.0	222.3	1.1	13.8	7.1	264.8

1/ The continuity of these data series estimates may be affected by changing data sources and estimation methodologies.

2/ Includes supplemental gaseous fuels.

3/ If applicable, through 1988, includes all net imports of electricity, and, from 1989, includes only the portion of imports of electricity that is derived from hydroelectric power.

4/ Geothermal, wind, photovoltaic, and solar thermal energy.

5/ From 1989, "Total" does not equal the sum of the columns. Net imports of electricity generated from nonrenewable energy sources are included in the total but not in any other columns.

6/ Data have been revised from previous *Data Book*.

7/ There is a discontinuity between 1988 and 1989 due to the expanded coverage of renewable energy sources beginning in 1989.

Source: U.S. Department of Energy, Energy Information Administration, *State Energy Data Report 2000* <http://www.eia.doe.gov/emeu/states/sep_use//total/pdf/use_all.pdf> table 7 accessed August 11, 2003.

**Table 17.03-- CONSUMPTION OF ENERGY BY END-USE SECTOR
(TRILLION BTU): 1960 TO 2000**

[Includes electricity sales and associated electrical system energy losses]

Year	Consumption				Input at electric utilities
	Residential	Commercial	Industrial	Transportation	
1960	7.3	5.2	20.6	61.8	17.6
1965	10.1	6.8	34.7	79.0	27.6
1970	16.4	11.6	43.7	125.3	43.2
1975	19.6	13.8	50.4	130.5	58.8
1980	23.2	20.8	74.7	146.7	69.7
1985	20.9	20.3	67.5	1/ 143.3	70.0
1986	21.3	22.8	67.3	126.9	72.9
1987	22.8	26.0	69.2	125.2	76.6
1988	23.9	39.2	76.7	142.0	81.9
1989	26.1	38.0	2/ 86.6	154.5	85.8
1990	3/ 26.1	3/ 34.3	2/ 3/ 94.8	156.9	86.1
1991	24.3	28.2	2/ 89.3	151.4	79.2
1992	24.1	32.8	2/ 91.8	142.9	74.6
1993	20.9	22.7	2/ 98.0	126.8	66.2
1994	20.6	25.4	2/ 99.2	135.3	64.7
1995	21.0	24.4	2/ 101.2	135.4	66.5
1996	21.7	23.8	2/ 102.7	120.0	68.2
1997	21.6	24.2	2/ 97.3	116.6	67.0
1998	23.1	35.4	2/ 89.3	114.6	67.3
1999	23.0	24.8	2/ 86.1	122.3	69.4
2000	23.7	25.7	88.7	126.7	70.8

1/ There is a discontinuity between 1980 and 1981 due to the expanded coverage of renewable energy sources beginning in 1981.

2/ Data have been revised from previous *Data Book*.

3/ There is a discontinuity between 1988 and 1989 due to the expanded coverage of renewable energy sources beginning in 1989.

Source: U.S. Department of Energy, Energy Information Administration, *State Energy Data Report 2000* <http://www.eia.doe.gov/emeu/states/sep_use/total/pdf/use_hi.pdf> table 8-12 accessed August 11, 2003.

Table 17.04-- PRIMARY ENERGY CONSUMPTION AND ELECTRICITY SALES, TOTAL AND PER CAPITA: 1991 TO 2000

Year	Primary energy consumption		Electricity sales by utilities	
	Total (trillion Btu)	Per capita 1/ (million Btu)	Total (1,000 kWh)	Per capita 1/ (kWh)
1991	322.95240	2/ 258.999	8,564,032	2/ 6,868
1992	339.09120	2/ 268.486	8,643,562	2/ 6,844
1993	307.74649	2/ 244.920	8,657,905	2/ 6,890
1994	2/ 327.47782	2/ 256.610	8,948,458	2/ 7,012
1995	2/ 315.11859	2/ 245.854	9,187,429	2/ 7,168
1996	315.94920	2/ 245.953	9,378,962	2/ 7,301
1997	315.99270	2/ 242.027	9,345,281	2/ 7,158
1998	302.87730	2/ 231.316	9,261,071	2/ 7,073
1999	308.40090	235.846	9,379,808	7,173
2000 3/	325.21084	243.059	9,690,599	7,243

1/ Based on estimated de facto population.

2/ Revised.

3/ Preliminary.

Source: Hawaii State Department of Business, Economic Development & Tourism, Energy, Resources and Technology Division, records; Hawaii State Department of Commerce and Consumer Affairs, records.

**Table 17.05-- PRIMARY ENERGY CONSUMPTION, BY SOURCE:
1988 TO 2000**

[Trillion Btu]

Year	Total	Petroleum	Biomass	Solar hot water
1988	306.9212	279.1052	22.7080	2.1931
1989	315.0842	289.2301	20.8020	2.3310
1990	312.1304	284.4906	18.1200	2.3400
1991	322.9524	294.6222	17.9000	2.3000
1992	339.0912	305.7758	16.9840	2.3000
1993	307.7465	266.9516	16.8310	2.3000
1994	327.4778	285.5010	16.3660	2.3000
1995	315.1186	273.9590	11.8232	2.8386
1996	315.9492	277.1298	10.3994	3.1225
1997	315.9927	278.3480	8.9527	3.1225
1998	302.8773	269.1272	7.5220	3.1225
1999	308.4009	272.4720	9.2784	3.5483
2000 1/	325.2108	290.2354	7.1331	3.5483

Year	Hydroelectric	Coal	Wind	Geothermal	Solid waste
1988	0.9826	1.3509	0.4185	0.1629	-
1989	1.0183	0.8715	0.4189	0.1435	0.2689
1990	1.0700	0.8900	0.2900	-	4.9298
1991	1.0000	0.8000	0.3060	-	6.0242
1992	0.7226	6.9207	0.2573	0.0168	6.1140
1993	0.8024	13.2237	0.2352	1.5988	5.8038
1994	1.5300	13.5599	0.2251	1.8060	6.1898
1995	1.0632	16.5249	0.2364	2.3045	6.3688
1996	1.1332	16.9294	0.2244	2.3566	4.6539
1997	0.9544	16.7772	0.1796	2.3633	5.2950
1998	0.7654	14.7665	0.2159	2.2782	5.0796
1999	1.2410	14.5187	0.1738	2.0255	5.1432
2000 1/	0.9481	15.4724	0.1794	2.5855	5.1086

1/ Preliminary.

Source: Hawaii State Department of Business, Economic Development & Tourism, Energy, Resources and Technology Division, records; Hawaii State Department of Commerce and Consumer Affairs, records.

Table 17.06-- ELECTRICITY GENERATION BY SOURCE: 1989 TO 1998

[Millions of kWh generated]

Year	Total	Petroleum	Biomass	MSW 1/	Hydroelectric
1989	9,280	8,511	614	-	100
1990	9,566	8,589	538	-	105
1991	9,610	8,664	495	-	92
1992	10,104	8,556	460	-	67
1993	10,219	7,576	435	349	78
1994	10,341	7,793	423	379	148
1995	10,563	7,853	292	383	103
1996	10,742	8,027	270	326	110
1997	10,424	7,805	226	371	93
1998 4/	10,455	8,009	178	364	87

Year	Geothermal	Wind	Coal	PV 2/	Other 3/
1989	14	41	-	-	(Z)
1990	-	28	-	-	306
1991	-	30	-	-	329
1992	1	21	-	-	999
1993	155	24	1,592	(Z)	10
1994	175	22	1,382	(Z)	19
1995	223	23	1,674	(Z)	12
1996	228	22	1,740	(Z)	19
1997	229	17	1,663	(Z)	20
1998 4/	220	21	1,553	(Z)	20

Z Less than 500,000 kWh.

1/ Electricity generated from Honolulu municipal solid waste plant.

2/ Electricity generated from photovoltaic.

3/ From 1989 to 1992, includes electricity production by coal, geothermal (a test well which ceased operation in 1989), and photovoltaic.

4/ Preliminary

Source: Hawaii State Department of Business, Economic Development & Tourism, Energy, Resources and Technology Division, records; Hawaii State Department of Commerce and Consumer Affairs, records; Hawaii Agriculture Research Center, records.

**Table 17.07-- ELECTRICITY PRODUCTION, BY SOURCE, BY ISLANDS:
1998**

[Million kWh]

Island	Total	Petroleum	Biomass	MSW 1/	Hydroelectric
State total	10,455	8,010	178	364	87
Hawaii	1,040	627	-	-	49
Maui	1,171	1,008	112	-	21
Lanai	28	28	-	-	-
Molokai	38	38	-	-	-
Oahu	7,723	5,937	-	364	-
Kauai	455	372	66	-	17
Island	Wind	Geothermal	Coal	PV 2/	Other
State total	21	220	1,555	(Z)	20
Hawaii	21	220	123	(Z)	-
Maui	-	-	30	(Z)	-
Lanai	-	-	-	-	-
Molokai	-	-	-	-	-
Oahu	-	-	1,402	(Z)	20
Kauai	-	-	-	-	-

Z. Less than 500,000 kWh.

1/ Electricity generated from Honolulu municipal solid waste plant.

2/ Electricity generated from photovoltaic.

Source: Hawaii State Department of Business, Economic Development & Tourism, Energy, Resources and Technology Division, records; Hawaii State Department of Commerce and Consumer Affairs, records.

**Table 17.08-- EXPENDITURES FOR FUELS AND ELECTRICITY, BY
SOURCE: 1991 TO 2000**

[Millions of dollars]

Year	Total energy expenditures	Fuel expenditures			Less: electric utility fuel expenditures	Plus: electricity purchased by end-user
		Total	Electric utility	Other		
1991	2,217.5	1,736.4	304.8	1,431.6	304.8	785.9
1992	2,340.3	1,760.0	238.2	1,521.8	238.2	818.5
1993	2,369.9	1,660.4	213.3	1,447.1	213.3	922.8
1994	2,397.0	1,642.5	201.4	1,441.1	201.4	955.9
1995	2,459.4	1,645.2	223.5	1,421.7	223.5	1,037.7
1996	2,712.0	1,843.9	268.9	1,575.0	268.9	1,137.0
1997	2,756.5	1,863.6	276.2	1,587.4	276.2	1,169.2
1998	2,442.9	1,580.2	210.9	1,369.3	210.9	1,073.6
1999	2,544.6	1,656.2	234.7	1,421.5	234.7	1,123.1
2000 1/	3,383.0	2,417.4	394.2	2,023.2	394.2	1,359.8

1/ Preliminary.

Source: Hawaii State Department of Business, Economic Development & Tourism, Energy, Resources and Technology Division, records; Hawaii State Department of Commerce and Consumer Affairs, records.

Table 17.09-- ELECTRIC UTILITIES: 1992 TO 2003

Year	Customers, Dec. 31			Power sold (1,000 kWh)		
	Total	Residen- tial 1/	Other	Total	Residen- tial 1/	Other
1992	385,055	332,863	52,192	8,666,889	2,430,152	6,213,410
1993	395,402	341,471	53,931	8,657,903	2,453,830	6,204,075
1994	403,595	346,977	56,618	8,948,458	2,551,240	6,397,218
1995	409,983	352,589	57,394	9,187,430	2,597,010	6,590,419
1996	413,830	356,205	57,625	9,378,962	2,669,654	6,709,308
1997	415,964	358,683	57,281	9,345,281	2,659,248	6,686,033
1998	418,989	361,429	57,560	9,261,070	2,634,172	6,626,899
1999	424,603	366,273	58,330	9,379,808	2,683,408	6,696,400
2000	430,354	370,928	59,426	9,690,598	2,764,619	6,925,980
2001	436,150	376,054	60,096	9,776,882	2,802,432	6,974,450
2002	441,323	380,608	60,715	9,958,768	2,921,563	7,037,206
2003	449,354	387,162	62,192	10,206,405	3,024,509	7,181,897

Year	Average annual use (kWh) 2/		Average rate (dollars per kWh)		Revenues (\$1,000)		
	Residen- tial 1/	Other	Residen- tial 1/	Other	Total	Residen- tial 1/	Other
1992	7,301	119,049	0.10932	0.08898	818,525	265,667	552,858
1993	7,186	115,037	0.12309	0.10005	922,796	302,054	620,743
1994	7,353	112,989	0.12464	0.09972	955,907	317,984	637,923
1995	7,366	114,828	0.13337	0.10490	1,037,702	346,359	691,343
1996	7,495	116,431	0.14272	0.11268	1,137,045	381,011	756,034
1997	7,414	116,723	0.14839	0.11584	1,169,134	394,603	774,531
1998	7,288	115,130	0.13884	0.10682	1,073,610	365,719	707,891
1999	7,326	114,802	0.14312	0.11037	1,123,126	384,043	739,083
2000	7,453	116,548	0.16409	0.13083	1,359,756	453,650	906,106
2001	7,452	116,055	0.16336	0.13095	1,371,113	457,797	913,317
2002	7,676	115,906	0.15703	0.12508	1,338,980	458,781	880,199
2003	7,812	115,479	0.16743	0.13629	1,485,234	506,399	978,835

1/ Residential refers to single-metered residential customers which may include condominiums for visitor use but excludes master-metered apartment and condominium buildings used by residents which are classified as commercial customers.

2/ Based on number of customers at end of year.

Source: Hawaii State Department of Commerce and Consumer Affairs, Division of Consumer Advocacy, records.

Table 17.10-- ELECTRIC UTILITIES, BY ISLANDS: 2003

Island	Customers, Dec. 31			Gross System Peak 2/	Power sold (1,000 kWh)		
	Total	Residential 1/	Other	(mW)	Total	Residential 1/	Other
State total	449,354	387,162	62,192	(X)	10,206,405	3,024,509	7,181,897
Oahu	286,677	253,033	33,644	1,284.0	7,522,230	2,066,522	5,455,707
Hawaii	68,893	57,257	11,636	190.9	1,046,142	389,874	656,268
Kauai	32,361	24,762	7,599	73.5	431,315	148,600	282,715
Lanai	1,526	1,319	207	5.1	28,136	7,515	20,621
Maui	56,880	48,327	8,553	202.0	1,142,689	398,949	743,741
Molokai	3,017	2,464	553	6.6	35,894	13,048	22,846
Island	Average annual use (kWh) 3/		Average rate (dollars per kWh)		Revenues (\$1,000)		
	Residential 1/	Other	Residential 1/	Other	Total	Residential 1/	Other
State total	7,812	115,479	0.16743	0.13629	1,485,234	506,399	978,835
Oahu	8,167	162,160	0.14888	0.11970	960,717	307,671	653,046
Hawaii	6,809	56,400	0.22137	0.19346	213,268	86,305	126,963
Kauai	6,001	37,204	0.23352	0.22192	97,443	34,702	62,741
Lanai	5,697	99,619	0.23460	0.23516	6,612	1,763	4,849
Maui	8,255	86,957	0.18289	0.16954	199,057	72,964	126,093
Molokai	5,296	41,312	0.22953	0.22509	8,137	2,995	5,142

X Not applicable.

1/ Residential refers to single-metered residential customers which may include condominiums for visitor use but excludes master-metered apartment and condominium buildings used by residents which are classified as commercial customers.

2/ System peak is the maximum amount of energy required by the electrical system at a point in time. The island electrical systems are not interconnected, therefore, peaks are reported separately for each island.

3/ Based on number of customers at end of year.

Source: Hawaii State Department of Commerce and Consumer Affairs, Division of Consumer Advocacy, records.

Table 17.11-- GAS UTILITIES: 1992 TO 2003

[Excludes bottled gas]

Year	Customers, Dec. 31			Gas sold (1,000 therms)		
	Total	Residen- tial 1/	Other	Total	Residen- tial 1/	Other
1992	35,236	31,625	3,611	33,662	5,733	27,929
1993	35,908	32,293	3,615	33,268	5,750	27,518
1994	36,403	32,753	3,650	34,010	5,851	28,159
1995	36,619	32,950	3,669	33,740	5,793	27,948
1996	36,641	33,020	3,621	33,531	5,642	27,888
1997	36,575	32,977	3,598	32,980	5,603	27,377
1998	36,225	32,630	3,595	33,095	5,702	27,393
1999	36,363	32,757	3,606	34,099	5,577	28,522
2000	36,404	32,804	3,600	34,820	5,477	29,343
2001	36,431	32,833	3,598	34,159	5,401	28,758
2002	36,236	32,629	3,607	33,974	5,357	28,617
2003	36,046	32,415	3,631	33,556	5,170	28,386

Year	Average annual use (therms) 2/		Average rate (dollars per therm)		Revenues (\$1,000)		
	Residen- tial 1/	Other	Residen- tial 1/	Other	Total	Residen- tial 1/	Other
1992	181	7,735	1.79054	1.25466	45,307	10,265	35,042
1993	178	7,612	1.75962	1.22594	43,853	10,117	33,735
1994	179	7,715	1.71994	1.19455	43,700	10,064	33,637
1995	176	7,617	1.79670	1.25158	45,386	10,407	34,979
1996	171	7,702	2.10399	1.33578	49,124	11,872	37,252
1997	170	7,609	2.29075	1.40013	51,167	12,835	38,332
1998	175	7,620	2.16236	1.25934	46,826	12,329	34,497
1999	170	7,910	2.17266	1.24026	47,491	12,116	35,375
2000	167	8,151	2.45358	1.48560	57,031	13,439	43,592
2001	165	7,993	2.59225	1.56297	58,949	14,001	44,948
2002	164	7,934	2.87341	1.50635	58,500	15,393	43,107
2003	159	7,818	3.05760	1.71228	64,412	15,807	48,605

1/ Residential refers to single-metered residential customers which may include condominiums for visitor use but excludes master-metered apartment and condominium buildings used by residents which are classified as commercial customers.

2/ Based on number of customers at end of year.

Source: Hawaii State Department of Commerce and Consumer Affairs, Division of Consumer Advocacy, records.

Table 17.12-- GAS UTILITIES, BY ISLANDS: 2003

[Excludes bottled gas]

Island	Customers, December 31			Gas sold (1,000 therms)		
	Total	Residential 1/	Other	Total	Residential 1/	Other
State total	36,046	32,415	3,631	33,556	5,170	28,386
Oahu	33,252	29,990	3,262	30,470	4,781	25,689
Hawaii	1,644	1,351	293	2,148	218	1,931
Kauai	681	681	-	87	87	-
Maui	397	321	76	836	69	766
Molokai	72	72	-	15	15	-
Lanai	-	-	-	-	-	-

Island	Average annual use (therms) 2/		Average rate (dollars per therm)		Revenues (\$1,000)		
	Residential 1/	Other	Residential 1/	Other	Total	Residential 1/	Other
State total	159	7,818	3.05760	1.71228	64,412	15,807	48,605
Oahu	159	7,875	3.02293	1.72307	58,716	14,452	44,264
Hawaii	161	6,590	3.72250	1.64862	3,993	810	3,183
Kauai	128	-	3.49642	-	305	305	-
Maui	216	10,081	2.82044	1.51092	1,353	196	1,158
Molokai	202	-	3.00433	-	44	44	-
Lanai	-	-	-	-	-	-	-

1/ Residential refers to single-metered residential customers which may include condominiums for visitor use but excludes master-metered apartment and condominium buildings used by residents which are classified as commercial customers.

2/ Based on number of customers at end of year.

Source: Hawaii State Department of Commerce and Consumer Affairs, Division of Consumer Advocacy, records.

**Table 17.13-- SERVICE PROVIDED BY HAWAIIAN ELECTRIC COMPANY, INC.,
ON OAHU: 1991 TO 2003**

Year	Number of customers, Dec. 31		Net input 1/ (1,000 kWh)	Electricity sales (1,000 kWh)	Average annual residential use 2/ (kWh)	Average residential rate (dollars per kWh)	Generating capability Dec. 31 3/ (1000 kW)
	Total	Residential only					
1991	255,176	223,304	6,876,964	6,538,952	7,610	0.09354	1,440
1992	257,442	225,229	7,061,157	6,650,449	7,711	0.09925	1,666
1993	263,478	230,192	7,029,839	6,607,424	7,581	0.11414	1,669
1994	264,992	232,115	7,222,978	6,797,364	7,681	0.11342	1,669
1995	269,307	235,905	7,359,195	6,962,794	7,732	0.12302	1,669
1996	271,602	237,860	7,499,202	7,091,147	7,868	0.12944	1,669
1997	271,801	238,825	7,424,259	7,040,291	7,773	0.13360	1,669
1998	272,675	239,945	7,299,149	6,938,326	7,603	0.12556	1,669
1999	275,467	242,579	7,356,725	6,997,936	7,654	0.12741	1,669
2000	278,260	245,027	7,589,409	7,211,760	7,793	0.14477	1,669
2001	280,911	247,672	7,643,288	7,276,681	7,816	0.14255	1,669
2002	283,161	249,896	7,757,699	7,390,367	8,050	0.13859	1,669
2003	286,677	253,033	7,908,957	7,522,230	8,224	0.14888	1,669

1/ Net generation plus purchased power.

2/ Based on average number of customers during the year.

3/ Includes firm purchase power.

Source: Hawaiian Electric Company, Inc., records.

**Table 17.14-- SERVICE PROVIDED BY THE GAS COMPANY, INC.,
ON OAHU: 1991 TO 2003**

Calendar year	Customers, Dec. 31		Gas sold 1/ (1,000 therms)		Average annual residential usage 1/ (therms)
	Total	Residential	Total	Residential	
1991	32,487	29,278	30,866	5,331	182
1992	32,598	29,375	30,528	5,285	180
1993	33,206	29,984	30,027	5,287	176
1994	33,597	30,344	30,762	5,372	177
1995	33,472	30,492	30,582	5,332	175
1996	33,914	30,668	30,339	5,203	170
1997	33,800	30,574	29,836	5,176	169
1998	33,705	30,497	29,930	5,284	173
1999	33,614	30,384	30,830	5,154	170
2000	33,613	30,383	31,619	5,054	166
2001	33,625	30,403	31,071	4,990	164
2002	33,446	30,202	30,852	4,962	164
2003	33,252	29,990	30,470	4,781	159

1/ Includes liquefied petroleum gas.

Source: The Gas Company, records.

Table 17.15-- LIQUID FUEL TAX BASE: 1991 TO 2003

[In thousands of gallons. Liquid fuel sold in a given month is usually reported the following month. Annual totals accordingly refer to fuel sold during a 12-month period ending November 30]

Year reported	All types		Gasoline	Diesel oil		
	Total	Excluding aviation		Non-hwy.	Hwy. use	
1991	1,299,455	570,077	376,182	163,773		24,991
1992	1,286,118	574,716	381,118	162,983		26,289
1993	1,173,458	573,767	384,444	160,121		24,997
1994	1,240,366	578,758	392,404	152,628		29,692
1995	1,286,038	600,596	396,446	172,684		27,411
1996	1,147,866	588,896	394,989	160,102		29,864
1997	955,834	585,400	400,435	150,737		30,109
1998	954,860	597,410	394,674	169,930		28,983
1999	969,434	621,832	384,260	201,664		32,098
2000	1,053,114	684,247	400,920	246,426		33,282
2001	962,973	627,076	409,910	179,000		34,018
2002	1/ 994,141	646,185	429,613	175,096		36,157
2003	835,991	587,927	452,499	91,988		37,004

Year reported	Liquefied petroleum gas		Aviation fuel	Small boats		Other fuel
	Off hwy.	Hwy. use		Gasoline	Diesel oil	
1991	3,575	780	729,378	52	724	(X)
1992	3,644	532	711,402	48	102	(X)
1993	3,343	477	599,691	35	349	(X)
1994	3,210	566	661,608	60	198	(X)
1995	3,096	514	685,443	50	395	(X)
1996	3,249	413	558,969	50	228	(X)
1997	3,587	328	370,433	41	164	(X)
1998	3,280	383	357,450	9	151	(X)
1999	3,326	360	347,602	4	119	(X)
2000	3,250	332	368,867	2	35	(X)
2001	3,783	310	335,897	9	47	(X)
2002	4,991	267	1/ 347,956	5	40	16
2003	5,739	391	248,065	2	22	281

X Not applicable.

1/ Data have been revised from previous *Data Book*.

Source: Hawaii State Department of Taxation, Tax Research & Planning, "Liquid Fuel Tax Base & Tax Collections" (annual release).

Table 17.16-- LIQUID FUEL TAX BASE, BY COUNTIES: 2003

[In thousands of gallons. Liquid fuel sold in a given month is usually reported the following month. Annual totals accordingly refer to fuel sold during a 12-month period ending November 30]

Type of fuel	State total	City and Co. of Honolulu	County of Maui	County of Hawaii	County of Kauai
Total	835,991	545,318	128,417	111,971	50,286
Gasoline	452,499	264,236	73,689	82,310	32,264
Diesel oil, non-hwy.	91,988	70,515	5,043	11,198	5,232
Diesel oil, hwy. use	37,004	21,559	4,307	8,917	2,221
Liq. pet. gas, off hwy.	5,739	5,557	137	44	.5
Liq. pet. gas, hwy. use	391	360	17	4	10
Small boats, gasoline	2	2	-	-	-
Small boats, diesel oil	22	3	-	19	-
Aviation fuel	248,065	182,918	45,109	9,478	10,560
Other fuel	281	167	115	-	-

Source: Hawaii State Department of Taxation, Tax Research & Planning, "Liquid Fuel Tax Base & Tax Collections, Calendar Year Ending December 31, 2003", January 28, 2004
<http://www.state.hi.us/tax/monthly/2003cy-fuels-base.pdf>.

Table 17.17-- GASOLINE STATIONS WITH PAYROLL, BY COUNTIES

[Excludes most government employees and self-employed persons]

Year	State total	City and County of Honolulu	Hawaii County	Kauai County	Maui County
1987 1/	355	241	52	26	36
1992 1/	326	212	57	21	36
1997 2/	360	230	67	19	44
1999 2/	334	206	63	19	46
2000 2/	328	207	61	20	40
2001 2/	322	204	61	17	40

1/ SIC 554.

2/ NAICS 447.

Source: U.S. Bureau of the Census, *1987 Census of Retail Trade , Hawaii* , RC87-A-12 (May 1989), table 5; *1992 Census of Retail Trade , Hawaii* , RC92-A-12 (October 1994), table 4; *1997 Economic Census, Retail Trade, Hawaii* , EC97R44A-HI (November 1999), tables 1 and 3; U.S. Census Bureau, *County Business Patterns Hawaii: 2000* , CPB-00-13 (May 2002), tables 1 and 6 <<http://www.census.gov/prod/2002pubs/00cbp/cbp00-13.pdf>> accessed June 12, 2002; U.S. Census Bureau, *County Business Patterns Hawaii: 2001* , CPB-01-13 (April 2003), tables 1 and 6 <<http://www.census.gov/prod/2003pubs/01cbp/cbp01-13.pdf>> accessed May 15, 2003.

**Table 17.18-- BOILERS AND PRESSURE VESSELS, BY ISLANDS:
2002 AND 2003**

[As of December 31]

Island	Total	Power boilers	Heating boilers	Pressure vessels
2002 1/				
State total	9,755	537	2,481	6,737
Hawaii	1,339	83	319	937
Maui	1,250	78	310	862
Lanai	51	4	14	33
Molokai	74	7	25	42
Oahu	6,509	322	1,697	4,490
Kauai	532	43	116	373
2003				
State total	9,757	525	2,498	6,744
Hawaii	1,370	85	325	960
Maui	1,278	69	300	909
Lanai	50	3	14	33
Molokai	58	6	15	37
Oahu	6,453	309	1,729	4,415
Kauai	548	43	115	390

1/ Data have been revised from previous *Data Book*.

Source: Hawaii State Department of Labor and Industrial Relations, Hawaii Occupational Safety & Health Division (HIOSH), Boiler and Elevator Inspection Branch, records.

**Table 17.19-- FEDERAL OBLIGATIONS FOR RESEARCH AND DEVELOPMENT
AND FOR R&D PLANT IN HAWAII: 1996 TO 2001**

[Millions of dollars. For fiscal years ended September 30]

Type of obligation	1996	1997	1998	1999	2000	2001
R&D	147.6	150.7	164.5	198.8	209.7	293.1
R&D plant	1.7	3.0	1.5	9.3	1.8	2.8

Source: National Science Foundation/Division of Science Resources Statistics, *Federal Funds for Research and Development: Fiscal Years 2001, 2002 and 2003*, tables C-111a and C-112a.

Table 17.20-- CHARACTERISTICS OF THE PRIVATE TECHNOLOGY SECTOR

Category and year	Total private sector	Private technology				
		All categories	Bio-technology	Information technology	Research development & tech education	Tele-communications
Operating units						
1996	31,253	741	19	415	140	167
1997	31,182	756	20	441	138	157
1998	31,253	806	24	469	149	164
1999	31,257	881	27	527	146	181
2000	33,554	1,056	31	664	167	194
2001	34,288	1,152	37	733	173	209
Average paid employment						
1996	427,676	10,607	140	2,372	1,772	6,323
1997	426,968	11,110	206	2,650	1,693	6,561
1998	426,255	12,031	509	3,200	1,596	6,727
1999	429,179	12,417	601	3,584	1,636	6,598
2000	443,220	13,016	656	4,026	1,800	6,534
2001	446,107	13,553	913	4,416	1,819	6,405
Total wages (\$million)						
1996	11,208	435.1	4.2	97.3	63.5	270.0
1997	11,516	285.4	5.9	122.4	61.7	285.4
1998	11,791	534.4	13.1	160.8	67.2	293.2
1999	12,084	581.7	15.6	188.4	69.6	308.1
2000	12,933	646.2	22.5	221.9	80.8	321.1
2001	13,293	688.0	27.1	247.8	90.7	322.3
Average annual wage						
1996	26,207	41,019	31,161	41,034	35,839	42,705
1997	26,973	42,758	28,455	46,190	36,445	43,497
1998	27,661	44,414	25,733	50,254	42,133	43,589
1999	28,155	46,893	27,148	52,565	42,540	46,700
2000	29,179	49,649	34,258	55,104	44,882	49,146
2001	29,797	50,762	29,713	56,121	49,876	50,319

Source: Hawaii State Department of Business, Economic Development & Tourism, DBEDT e-Reports "Hawaii's Technology Sector in 2001", November 2002 <<http://www.hawaii.gov/dbedt/tech02/index.html>> accessed January 14, 2003.

**Table 17.21-- SHARE OF TECHNOLOGY SECTOR JOBS, BY COUNTY:
1999 AND 2001**

[In percent]

Year	Hawaii	Maui	Honolulu	Kauai	County unknown
1999	7	8	80	4	1
2001	6	8	82	4	< 1

Source: Hawaii State Department of Business, Economic Development & Tourism, DBEDT e-reports "Hawaii's Expanding Tech Sector", May 2001; DBEDT e-Reports "Hawaii's Technology Sector in 2001", November 2002 <<http://www.hawaii.gov/dbedt/tech02/index.html>> accessed January 14, 2003.

**Table 17.22-- RESEARCH AND NON-RESEARCH EXTRAMURAL FUNDING,
FOR THE UNIVERSITY OF HAWAII: 1991-92 TO 2002-03**

[Research and non-research awards received through the Office of Research Services, University of Hawaii, and non-competitive awards from the U.S. Department of Agriculture]

Fiscal year	Total		Research		Non-research	
	Awards	Amount (dollars)	Awards	Amount (dollars)	Awards	Amount (dollars)
1991-92	1,221	124,876,638	703	65,791,624	518	59,085,014
1992-93	1,146	131,075,215	636	61,059,928	510	70,015,287
1993-94	1,322	142,563,794	755	77,763,782	567	64,800,012
1994-95	1,147	139,199,221	616	70,222,653	531	68,976,568
1995-96	1,191	134,469,155	697	76,698,552	494	57,770,603
1996-97	1,255	160,859,800	724	89,131,636	531	71,728,164
1997-98	1,300	159,948,612	763	91,746,988	537	68,201,624
1998-99	1,254	164,168,101	707	92,737,645	547	71,430,456
1999-00	1,379	180,629,855	767	102,845,010	612	77,784,845
2000-01	1,405	216,233,918	835	132,833,308	570	83,400,610
2001-02	1,629	252,370,477	971	141,875,022	658	110,495,455
2002-03	1,646	323,868,218	976	190,374,465	670	133,493,753

Source: University of Hawaii, Office of Research Services, *2002 -2003 Extramural Awards*, p. i;
<<http://www.hawaii.edu/ors/orsann/YearList.htm>>.

**Table 17.23-- RESEARCH AND DEVELOPMENT EXPENDITURES AT
DOCTORATE-GRANTING INSTITUTIONS: FISCAL YEARS 1991 TO 2001**

[In \$1,000]

	Total	Federally financed	State and local government financed	Industry financed	Institutionally financed	All other sources
1991	78,166	44,857	27,321	856	3,391	1,741
1992	80,258	47,684	26,775	337	3,319	2,143
1993	73,961	41,362	27,099	151	3,109	2,240
1994	70,079	39,392	25,204	434	3,290	1,759
1995	78,429	44,238	26,789	299	3,738	3,365
1996	111,202	1/ 66,902	31,826	8,088	4,386	-
1997	120,107	72,421	28,440	5,944	13,297	5
1998	148,007	86,886	37,002	10,949	13,170	-
1999	156,810	93,418	35,111	13,021	15,260	-
2000	161,300	95,419	35,474	11,158	19,249	-
2001	156,976	97,716	33,125	7,232	18,903	-

1/ Data have been revised from previous *Data Book*.

Source: National Science Foundation/SRS, Academic Research and Development Expenditures. Fiscal Year 2001 (NSF 03-316) <<http://www.nsf.gov/sbe/srs/nsf03316/pdf/sectb.pdf>> accessed September 12, 2003.

Table 17.24-- PATENTS ISSUED TO HAWAII RESIDENTS: 1980 TO 2001

Calendar year	Patents	Calendar year	Patents	Calendar year	Patents
1980	35	1988	62	1996	104
1981	44	1989	71	1997	93
1982	30	1990	85	1998	93
1983	34	1991	80	1999	97
1984	39	1992	81	2000	93
1985	38	1993	106	2001	107
1986	46	1994	99		
1987	46	1995	84		

Source: U.S. Patent and Trademark Office, Information Products Division/TAF Branch, *Patent Counts by Country/State and Year, All Patents, All Types, January 1, 1977 -- December 31, 2001* (February 2002)
 <http://www.uspto.gov/web/offices/ac/ido/oeip/taf/cst_all.pdf> accessed July 31, 2003.

**Table 17.25-- ASTRONOMY AND RELATED FACILITIES AT
THE SUMMITS OF MAUNA KEA AND HALEAKALA: 2002**

Facility (mirror diameter in meters)	Capital cost 1/ (\$ mil)	Annual operating cost (\$ mil)	County based staff	Operational
Mauna Kea observatories:				
UH 0.6-m (Optical)	0.3	(2/)	(2/)	1968
UH 2.2-m (Optical/Infrared)	5	1.3	8	1970
Canada-France-Hawaii 3.6-m (Optical/Infrared)	30	6.2	50	1979
NASA IRTF 3.0-m (Infrared)	10	3.2	16	1979
United Kingdom 3.8-m (Infrared)	5	3.0	31	1979
James Clerk Maxwell 15-m Submillimeter	32	5.0	39	1986
Caltech 10.4-m Submillimeter	10	2.6	11	1986
W.M. Keck Observatory (Keck I & II)				
10-m x 2 (Optical/Infrared)	170	11.0	115	1992/96
VLBA Antenna 25-m (Radio)	7	0.25	2	1992
Submillimeter Array 8x6-m	80	6.0	36	2003
Subaru (Japan National Large Telescope)				
8-m (Optical/Infrared)	170	15.0	70	1999
Fredrick C. Gillett Gemini 8m (Optical/Infrared)	92	8.0	70	1999
Mauna Kea Observatories Support Services	(X)	3/ 2.4	28	(X)
Total	611	61.6	476	
Haleakala observatories:				
Mees Solar Observatory	0.5	0.1	2	1968
Lunar Ranging Facility	3.3	0.7	7	1976/84
Haleakala Observatories Projects	(NA)	0.5	4	1979
Maui Space Surveillance Site (MSSS) 4/ Advanced Electro-Optical System	200.0	16.0	120	1979
3.7-m Telescope (AEOS)	50.0	15.0	55	1997
Magnum 2-m Telescope 5/	5.0	0.25	1	2000
Faulkes 2-m Telescope 6/ Haleakala Support Facilities	5.0	(NA)	(NA)	2003
	(X)	0.13	6	(NA)
Total	263.8	32.68	195	

NA Not available.

X Not applicable.

1/ Historical cost, not adjusted for inflation.

2/ Combined budget and staffing with UH 2.2-m telescope.

3/ Not included in the total since derived from facility operating costs.

4/ Formerly Air Force Maui Optical Station (AMOS).

5/ MAGNUM = Multicolor Active Galactic Nuclei Monitoring.

6/ Under construction.

Source: University of Hawaii at Manoa, Institute for Astronomy, records.