

## Section 17

# ENERGY AND SCIENCE

This section presents statistics relating to electrical, gas and petroleum power and energy, and to scientific resources.

Electricity sales exceeded 5.8 billion kilowatt-hours in 1977, or 7,500 per residential customer. The total has doubled since 1967. Manufactured gas sales reached 34.8 million therms in 1977, 55 percent above the figure ten years earlier. Residential rates in 1977 averaged 5.2 cents per kilowatt-hour and 86 cents per therm, both well above the corresponding rates several years earlier.

The liquid fuel tax base for 1977 was approximately 888 million gallons, compared with 825 million in 1974 and 572 million in 1967. The 1977 total included 311 million gallons of gasoline, 473 million of aviation fuel, and 99 million of diesel oil. The average price for premium gasoline rose from 48.7 cents per gallon in October 1973 to 77.7 cents in April 1978.

Total energy consumption in 1974 amounted to 185 trillion British thermal units, compared with 104 trillion BTU a decade earlier. Transportation accounted for 58 percent of the 1974 total.

The State is well served with scientific resources. A 1976 inventory reported 384 companies and agencies with research or scientific capabilities. Employment in these organizations was more than 34,000. Forty-three patents were granted to Hawaii residents in 1977.

Information on communications, energy and science can be obtained from reports and records of the U.S. Bureau of Mines, Federal Energy Administration, Federal Power Commission, Hawaii State Department of Taxation, Hawaii State Department of Regulatory Agencies, Public Utilities Division, and individual utility companies. Detailed statistics on energy consumption, with special emphasis on petroleum products, appear in *Energy Use in Hawaii*, published by the State Energy Office of the Department of Planning and Economic Development in November 1977. *Hawaii's Scientific Resources, 1977 Directory*, issued by DPED in 1977, contains information on scientific organizations and facilities in the Islands. Data for the nation as a whole can be found in the *Statistical Abstract of the United States: 1977*, Sections 20 and 21.

**Table 275.—ELECTRIC UTILITIES: 1967 TO 1977**

Year	Customers, Dec. 31			Installed capacity, Dec. 31 (kW)	Power sold (1,000 kWh)		
	Total	Residential	Other		Total	Residential	Other
1967 .....	196,417	166,256	30,161	829,157	2,832,468	989,785	1,842,684
1968 .....	202,167	171,346	30,821	894,532	3,109,256	1,083,233	2,026,023
1969 .....	210,330	178,569	31,761	896,271	3,426,052	1,174,502	2,251,550
1970 .....	219,003	186,282	32,721	1,007,021	3,758,094	1,270,732	2,487,362
1971 .....	226,514	193,043	33,471	1,016,350	4,167,127	1,375,308	2,791,819
1972 .....	236,309	201,903	34,406	1,135,055	4,562,568	1,493,840	3,068,728
1973 .....	246,255	210,740	35,515	1,266,600	4,867,850	1,581,855	3,285,995
1974 .....	255,901	219,633	36,268	1,419,892	5,113,906	1,635,978	3,477,928
1975 .....	263,816	226,836	36,980	1,454,359	5,334,755	1,676,438	3,658,317
1976 .....	270,035	232,070	37,965	1,454,359	5,615,209	1,750,618	3,864,592
1977 .....	275,616	237,557	38,059	1,481,680	5,831,610	1,779,314	4,052,296

  

Year	Average annual use (kWh) <sup>1</sup>		Average rate (dollars per kWh)		Revenues (\$1,000)		
	Residential	Other	Residential	Other	Total	Residential	Other
1967 .....	5,953	61,109	.027039	.020037	63,686	26,763	36,923
1968 .....	6,322	65,735	.026803	.020022	69,598	29,034	40,564
1969 .....	6,577	70,890	.026548	.019647	75,418	31,181	44,237
1970 .....	6,822	76,017	.026810	.020113	84,097	34,068	50,029
1971 .....	7,124	83,410	.028229	.021493	98,849	38,823	60,026
1972 .....	7,399	89,192	.02849	.02172	109,217	42,557	66,660
1973 .....	7,506	92,524	.03077	.02367	126,449	48,680	77,769
1974 .....	7,449	95,895	.03493	.02704	151,177	57,149	94,028
1975 .....	7,391	98,927	.04586	.03794	215,677	76,885	138,792
1976 .....	7,543	101,794	.04796	.03934	235,999	83,957	152,042
1977 .....	7,490	106,474	.05222	.04408	271,553	92,917	178,636

<sup>1</sup> Based on number of customers at end of year.

Source: Hawaii State Department of Regulatory Agencies, Public Utilities Division, records.

**Table 276.—SERVICE PROVIDED BY HAWAIIAN ELECTRIC CO., INC., ON OAHU:  
1970 TO 1977**

Year	Number of customers, December 31		Net input <sup>1</sup> (1,000 KWH)	Power sold (1,000 KWH)	Average annual residential use (KWH)	Average residential rate <sup>2</sup> (dollars per KWH)	Installed capacity <sup>3</sup> (KW) 31 December
	Total	Residential only					
1970 .....	168,531	144,854	3,494,059	3,275,673	7,478	0.02438	811,700
1971 .....	174,300	150,285	3,844,325	3,600,728	7,776	0.02555	811,700
1972 .....	180,794	156,249	4,175,342	3,942,679	8,108	0.02584	902,600
1973 .....	187,321	162,180	4,407,460	4,189,397	8,191	0.02812	1,005,200
1974 .....	194,043	168,525	4,641,204	4,393,616	8,110	0.03063	1,140,180
1975 .....	198,598	172,839	4,793,015	4,555,118	7,999	0.04313	1,140,180
1976 .....	201,974	175,581	5,038,978	4,761,592	8,102	0.04385	1,140,180
1977 .....	205,225	179,139	5,209,990	4,911,435	8,035	0.04810	1,140,180

<sup>1</sup> Net generated plus purchased power.

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

<sup>3</sup> Maximum generator nameplate.

Source: Hawaiian Electric Co., Inc., records.

**Table 277.—ELECTRIC UTILITIES, BY ISLANDS: 1977**

County or island	Customers, Dec. 31			Installed capacity, Dec. 31 (kW)	Power sold (1,000 kWh)		
	Total	Residential	Other		Total	Residential	Other
State total .....	275,616	237,557	38,059	1,481,680	5,831,610	1,779,314	4,052,296
Oahu .....	205,225	179,139	26,086	1,209,400	4,911,435	1,427,942	3,483,493
Hawaii .....	30,715	25,312	5,403	124,300	376,808	153,115	223,693
Kauai .....	13,773	11,607	2,166	62,080	167,035	60,283	106,752
Maui County .....	25,903	21,499	4,404	85,900	376,332	137,974	238,358
Lanai .....	844	675	169	—	6,052	3,630	2,422
Maui .....	23,123	19,306	3,817	79,050	347,091	124,250	222,841
Molokai .....	1,936	1,518	418	6,850	23,189	10,094	13,095

  

County or island	Average annual use <sup>1</sup> (kWh)		Average rate (dollars per kWh)		Revenues (\$1,000)		
	Residential	Other	Residential	Other	Total	Residential	Other
State total .....	7,490	106,474	0.05222	0.04408	271,553	92,917	178,636
Oahu .....	7,971	133,539	0.04740	0.03965	205,820	67,686	138,134
Hawaii .....	6,049	41,402	0.07298	0.06886	26,577	11,174	15,403
Kauai .....	5,194	49,285	0.07941	0.08124	13,460	4,787	8,673
Maui County .....	6,418	54,123	0.06719	0.06891	25,696	9,270	16,426
Lanai .....	5,378	14,329	0.07270	0.08243	464	264	200
Maui .....	6,436	58,381	0.06633	0.06717	23,209	8,242	14,967
Molokai .....	6,650	31,329	0.07576	0.09615	2,023	764	1,259

<sup>1</sup> Based on number of customers at end of year.

Source: Hawaii State Department of Regulatory Agencies, Public Utilities Division, records.

**Table 278.—GAS UTILITIES: 1967 TO 1977**  
[Excludes bottled gas]

Year	Customers, Dec. 31			Gas sold (1,000 therms)		
	Total	Residential	Other	Total	Residential	Other
1967 .....	36,382	35,000	1,382	22,547	11,348	11,198
1968 .....	36,255	34,955	1,300	23,570	11,331	12,240
1969 .....	36,134	34,829	1,305	25,649	11,848	13,801
1970 .....	36,142	32,163	3,979	27,831	10,891	16,940
1971 .....	36,153	32,072	4,081	30,445	9,279	21,167
1972 .....	36,083	31,806	4,277	33,322	9,321	24,000
1973 .....	35,781	31,142	4,639	34,540	8,931	25,609
1974 .....	35,228	30,620	4,608	34,363	8,096	26,267
1975 .....	34,685	30,236	4,449	35,594	8,230	27,364
1976 .....	34,264	29,873	4,391	35,568	8,121	27,447
1977 .....	33,722	29,408	4,314	34,844	7,612	27,232

  

Year	Average annual use (therms) <sup>1</sup>		Average rate (dollars per therm)		Revenues (\$1,000)		
	Residential	Other	Residential	Other	Total	Residential	Other
1967 .....	324	8,103	.3618	.2179	6,546	4,106	2,440
1968 .....	324	9,415	.3618	.2169	6,754	4,099	2,655
1969 .....	340	10,576	.3588	.2156	7,227	4,251	2,976
1970 .....	339	4,257	.3619	.2227	7,714	3,941	3,773
1971 .....	289	5,187	.3699	.2308	8,317	3,432	4,885
1972 .....	293	5,612	.36843	.22681	8,878	3,434	5,444
1973 .....	287	5,520	.37518	.23121	9,272	3,351	5,921
1974 .....	264	5,700	.68361	.52267	19,264	5,535	13,729
1975 .....	272	6,151	.81723	.63583	24,125	6,726	17,399
1976 .....	272	6,251	.82767	.63369	24,115	6,722	17,393
1977 .....	259	6,313	.85883	.65821	24,462	6,537	17,925

<sup>1</sup> Based on number of customers at end of year.

Source: Hawaii State Department of Regulatory Agencies, Public Utilities Division, records.

**Table 279.—GAS UTILITY SERVICE BY GASCO, INC., FOR OAHU:  
1967 TO 1977**

Calendar year	Customers <sup>1</sup>		Gas sold (1,000 therms) <sup>2</sup>		Average annual residential usage (therms) <sup>2</sup>
	Total	Residential	Total	Residential	
1967 .....	34,237	32,862	21,708	10,701	326
1968 .....	34,079	32,787	22,668	10,666	325
1969 .....	33,908	32,611	24,659	11,102	340
1970 .....	33,851	29,880	26,696	10,026	336
1971 .....	33,691	29,621	29,082	8,290	280
1972 .....	33,479	29,256	31,643	8,258	282
1973 .....	33,142	28,813	32,610	8,041	279
1974 .....	32,455	28,200	32,166	7,522	267
1975 .....	31,856	27,778	32,885	7,600	274
1976 .....	31,443	27,429	32,649	7,490	276
1977 .....	30,926	26,993	31,831	7,007	260

<sup>1</sup> As of December 31. Data for residential customers, 1967-1970, may include a few commercial accounts.

<sup>2</sup> Includes liquefied petroleum gas.

Source: Gasco, Inc., records.

**Table 280.—GAS UTILITIES, BY ISLANDS: 1977**  
 [Excludes bottled gas.]

Island	Customer, Dec. 31			Gas sold (therms)		
	Total	Residential	Other	Total	Residential	Other
State total .....	33,722	29,408	4,314	34,844,043	7,611,799	27,232,244
Oahu .....	30,926	26,997	3,929	31,830,654	7,010,868	24,819,786
Hawaii .....	2,167	1,836	331	2,396,789	454,544	1,942,245
Kauai .....	232	232	—	64,528	64,528	—
Maui .....	397	343	54	552,072	81,859	470,213

  

Island	Average annual use (therms) <sup>1</sup>		Average rate (dollars per therm)		Revenues (\$1,000)		
	Residential	Other	Residential	Other	Total	Residential	Other
State total .....	259	6,313	0.85883	0.65821	24,462	6,537	17,925
Oahu .....	260	6,317	0.86855	0.66472	22,588	6,090	16,498
Hawaii .....	248	5,868	0.75063	0.58613	1,480	341	1,139
Kauai .....	278	—	0.76843	—	49	49	—
Maui .....	239	8,708	0.69826	0.61238	345	57	288

<sup>1</sup> Based on number of customers at end of year.

Source: Hawaii State Department of Regulatory Agencies, Public Utilities Division, records.

**Table 281.—TYPICAL RESIDENTIAL UTILITY MONTHLY RATES, BY ISLAND:  
JANUARY 1978**  
[In dollars]

Utility and monthly use	Oahu	Hawaii <sup>1</sup>	Kauai	Maui	Molokai	Lanai
<b>Water:</b>						
5/8-inch meter, 5,000 gallons ..	5.70	5.90	4.50	5.65	5.65	2.95
5/8-inch meter, 10,000 gallons ..	7.55	8.55	7.00	8.30	8.30	4.65
1-inch meter, 20,000 gallons ..	13.50	16.85	15.00	19.55	19.55	9.30
1½ inch meter, 50,000 gallons .....	28.10	37.50	35.00	44.75	44.75	22.00
<b>Electricity:<sup>2</sup></b>						
100 kilowatt-hours .....	9.44	13.28	10.77	10.97	13.61	11.29
250 kilowatt-hours .....	17.52	23.75	21.74	20.83	24.58	21.62
500 kilowatt-hours .....	28.98	37.61	37.84	34.45	40.47	36.03
750 kilowatt-hours .....	40.55	51.31	53.38	48.13	56.65	50.50
1,000 kilowatt-hours .....	52.51	65.52	68.92	62.30	73.43	65.46
<b>Gas:</b>						
10 therms .....	10.35	9.46	9.58	8.25	...	...
25 therms .....	21.36	19.86	21.05	18.19	...	...
50 therms .....	43.23	39.74	43.33	37.69	...	...
100 therms .....	80.23	73.34	80.83	70.64	...	...
<b>Telephone:<sup>3</sup></b>						
Individual line .....	9.50	8.50	8.10	8.10	6.95	6.25
Two-party line .....	7.80	7.15	6.85	6.85	5.90	5.35

<sup>1</sup>Water rates are those for South Hilo, North and South Kohala, and Ka'u; for other districts, add 12¢ per 1,000 gallons. Gas rates are those for South Hilo.

<sup>2</sup>Includes fuel adjustment surcharge.

<sup>3</sup>Excludes Federal excise tax (4 percent for 1978).

Source: Hawaii State Department of Regulatory Agencies, Public Utilities Division; Honolulu Board of Water Supply; Hawaii County Department of Water Supply; Kauai County Department of Water; Maui County Department of Water Supply; Koele Company, Inc.

**Table 282.—BOILERS AND PRESSURE VESSELS: DECEMBER 31, 1977**

Island	Power boilers	Heating boilers	Pressure vessels <sup>1</sup>
State total .....	668	2,392	4,502
Hawaii .....	90	236	653
Maui .....	60	161	532
Lanai .....	3	2	24
Molokai .....	5	29	30
Oahu .....	461	1,849	3,032
Kauai .....	49	115	231

<sup>1</sup> Five cubic feet or more.

Source: Hawaii State Department of Labor and Industrial Relations, Division of Occupational Safety and Health, records.



**Table 283.—LIQUID FUEL TAX BASE: 1967 TO 1977**

[In thousands of gallons. Excludes residual fuel, used in the generation of electrical power.]

Year reported <sup>1</sup>	All types	Gasoline	Diesel oil		Liq. pet. gas		Aviation fuel	Small boats	
			Non-hwy.	Hwy. use	Off-hwy.	Hwy. use		Gasoline	Diesel oil
1967 .....	572,354	188,717	39,569	5,511	457	139	336,359	250	1,351
1968 .....	619,803	197,663	41,213	6,566	781	253	371,686	227	1,415
1969 .....	743,255	223,088	49,147	7,703	674	242	460,753	226	1,424
1970 .....	754,632	235,178	58,129	8,029	814	274	450,474	214	1,519
1971 .....	809,628	250,191	57,405	8,852	1,044	579	489,767	231	1,559
1972 .....	827,825	261,452	65,163	9,523	1,231	702	487,743	264	1,747
1973 .....	882,932	281,122	74,608	11,159	1,909	453	511,502	280	1,899
1974 .....	824,653	270,267	75,124	11,539	2,093	789	463,728	312	801
1975 .....	839,289	284,552	75,120	12,710	1,823	1,380	462,384	411	908
1976 .....	850,261	295,704	79,884	13,561	1,858	1,054	456,819	464	917
1977 .....	888,136	311,409	85,484	13,817	2,036	1,280	472,654	558	899

<sup>1</sup> Liquid fuel sold in a given month is usually reported the following month. Annual totals accordingly refer to fuel sold in a 12-month period ended November 30.

Source: Hawaii State Department of Taxation, "Tax Base for Certain Taxes," "Comparison of Liquid Fuel Tax Collections & Distribution for Two Years," and "Liquid Fuel Tax Base and Tax Collections" (annual reports).

**Table 284.—DOMESTIC DEMAND FOR PETROLEUM PRODUCTS: 1967 TO 1976**

[Barrels daily]

Calendar year	Total	Usage		Product			
		Military <sup>1</sup>	Civilian	Gasoline	Jet fuel	Residual fuel oil	Other products <sup>2</sup>
1967 <sup>3</sup> .....	64,517	567	63,950	13,206	21,855	23,901	5,555
1968 .....	71,700	753	70,947	13,674	25,637	26,585	5,804
1969 .....	77,710	1,743	75,967	14,394	28,988	27,389	6,939
1970 .....	79,622	3,321	76,301	14,901	31,373	26,460	6,888
1971 .....	85,592	1,051	84,541	16,187	32,332	30,156	6,917
1972 .....	90,480	2,671	87,809	17,333	32,688	31,735	8,724
1973 .....	93,025	3,460	89,565	18,058	33,778	31,907	9,282
1974 .....	89,860	5,164	84,696	19,661	30,241	30,704	9,254
1975 .....	87,970	3,121	84,849	17,858	30,605	30,532	8,975
1976 .....	90,363	2,642	87,721	19,891	29,811	30,664	9,997

<sup>1</sup> Excludes imports and direct shipments.

<sup>2</sup> Liquefied gases, kerosine, distillate fuel oil, lubricating oils and greases, asphalt and road oil, etc.

<sup>3</sup> Earliest year available.

Source: U.S. Bureau of Mines, "District V Military and Civilian Petroleum Demand," *Mineral Industry Surveys* (for 1967 to 1969); "Crude Petroleum, Petroleum Products, and Natural Gas Liquids in P.A.D. District V," *Mineral Industry Surveys* (for 1970 to 1974); U.S. Department of Energy, "Crude Petroleum, Petroleum Products, and Natural Gas Liquids in P.A.D. District V," *Energy Data Reports* (for 1975 and 1976).

**Table 285.—DOMESTIC DEMAND FOR PETROLEUM PRODUCTS: 1975 AND 1976**  
[Barrels daily]

Item	Total		Military <sup>1</sup>		All other	
	1975	1976	1975	1976	1975	1976
Total petroleum .....	87,970	90,363	3,121	2,642	84,849	87,721
Liquefied gases .....	1,134	1,128	—	—	1,134	1,128
Fuel uses .....	1,134	1,128	—	—	1,134	1,128
Other .....	—	—	—	—	—	—
Gasoline .....	17,858	19,891	154	596	17,704	19,295
Motor .....	17,644	19,637	154	596	17,490	19,041
Aviation .....	214	254	—	—	214	254
Special naphthas and solvents ..	121	112	—	—	121	112
Jet fuel .....	30,605	29,811	2,759	1,705	27,846	28,106
Naphtha-type .....	2,759	1,694	2,759	1,694	—	—
Kerosine-type .....	27,846	28,117	—	11	27,846	28,106
Kerosine .....	38	246	3	8	35	238
Distillate fuel oil .....	5,871	6,571	205	333	5,666	6,238
Lubricating oils and greases ..	244	276	—	—	244	276
Residual fuel oil .....	30,532	30,664	—	—	30,532	30,664
Asphalt and road oil .....	1,099	1,128	—	—	1,099	1,128
All other finished and unfinished oils .....	—	—	—	—	—	—
Still gas .....	468	536	—	—	468	536

<sup>1</sup> Excludes imports and direct shipments.

Source: U.S. Department of Energy, "Crude Petroleum, Petroleum Products, and Natural Gas Liquids in P.A.D. District V, Year 1976," *Energy Data Reports*, February 17, 1978, pp. 3-4.

**Table 286.—ENERGY CONSUMPTION, BY TYPE AND CONSUMING SECTOR: 1960 TO 1974**  
 [In trillion British thermal units]

Year	Gross consumption								Utility electricity distributed	Net consumption
	Total gross consumption	By energy type <sup>1</sup>		By consuming sector						
		Petroleum products	Hydro-power	Household and commercial	Industrial	Transportation <sup>2</sup>	Electric power	Miscellaneous <sup>2</sup>		
1960 .....	76.1	75.9	0.2	1.4	8.7	41.8	23.1	1.1	6.2	59.2
1961 .....	94.5	94.3	0.2	3.5	11.5	54.3	24.3	0.9	6.9	77.1
1962 .....	86.0	85.8	0.2	4.2	10.1	43.5	26.1	2.1	7.4	67.3
1963 .....	93.4	93.1	0.3	4.2	9.2	49.9	27.7	2.4	7.8	73.5
1964 .....	103.7	103.3	0.4	3.7	10.4	57.1	30.4	2.1	8.6	81.9
1965 .....	109.6	109.3	0.3	4.1	10.5	60.7	30.9	3.4	9.2	87.9
1966 .....	122.0	121.7	0.3	4.0	10.8	70.5	33.2	3.5	9.9	98.7
1967 .....	135.1	134.8	0.3	4.0	7.5	81.6	31.4	10.6	10.6	114.3
1968 .....	152.1	151.9	0.2	5.1	11.3	97.5	34.6	3.6	11.7	129.2
1969 .....	163.3	163.0	0.3	6.5	13.4	103.7	38.5	1.2	12.9	137.7
1970 .....	169.9	169.7	0.2	7.9	14.0	104.0	43.0	1.0	14.1	141.0
1971 .....	180.7	180.5	0.2	6.7	12.8	113.3	47.5	0.4	15.6	148.8
1972 .....	186.3	186.1	0.2	6.2	13.3	111.6	52.8	2.4	17.3	150.8
1973 .....	192.4	192.2	0.2	5.8	12.5	115.6	55.5	3.0	18.2	155.1
1974 .....	184.9	184.7	0.2	5.9	10.6	107.5	57.5	3.4	19.2	146.6

<sup>1</sup> No consumption of anthracite, bituminous coal and lignite, natural gas, or nuclear power was recorded in this period.

<sup>2</sup> Highway use of distillate fuel oil needed in "miscellaneous" in 1967.

Source follows next table.

**Table 287.—PETROLEUM CONSUMPTION, BY TYPE AND CONSUMING SECTOR: 1964, 1973 AND 1974**

Petroleum product and consuming sector	Thousand barrels			Trillion British thermal units		
	1964	1973	1974	1964	1973	1974
Total .....	17,739	33,303	32,008	103.3	192.2	184.7 <sup>a</sup>
Type of petroleum:						
Gasoline .....	4,414	6,589	6,615	23.2	34.6	34.7
Jet fuel .....	3,468	11,970	10,601	19.7	67.9	60.1
Kerosine .....	48	41	75	0.2	0.2	0.4
Distillate fuel oil .....	1,769	1,839	1,997	10.3	10.7	11.6
Residual fuel oil .....	7,539	11,580	11,495	47.3	72.8	72.3
Liquefied petroleum gases .....	259	941	966	1.0	3.7	3.9
Asphalt .....	242	343	259	1.6	2.3	1.7
Consuming sector:						
Household and commercial .....	636	1,143	1,145	3.7	5.8	5.9
Industrial .....	1,731	2,144	1,851	10.4	12.5	10.6
Transportation .....	10,246	20,718	19,337	57.1	115.6	107.5
Electric power .....	4,783	8,816	9,137	30.0	55.3	57.3
Miscellaneous .....	343	482	538	2.1	3.0	3.4

Source of tables 286 and 287: U.S. Bureau of Mines, *Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts West of the Mississippi*, by L.H. Crump (Information Circular 8705, 1976), pp. 72-77; *Fuels and Energy Data: United States by States and Census Divisions, 1973*, by L.H. Crump (Information Circular 8722, 1976), pp. 41 and 93; and *Fuels and Energy Data: United States by States and Census Divisions, 1974*, by L.H. Crump (Information Circular 8739, 1977), pp. 53 and 144.

**Table 288.—AVERAGE PRICE PER GALLON FOR GASOLINE, FOR URBAN OAHU: 1973 TO 1978**  
 [In dollars. Average prices include all applicable taxes.]

Year	Leaded regular gasoline <sup>1</sup>		Unleaded regular gasoline <sup>2</sup>		Premium gasoline <sup>1</sup>	
	April	October	April	October	April	October
1973 .....	...	0.452	...	...	...	0.487
1974 .....	0.568	.593	...	...	0.602	.623
1975 .....	.623	.698	...	...	.654	.740
1976 .....	.673	.704	0.682	0.712	.710	.739
1977 .....	.711	.721	.723	.740	.752	.765
1978 <sup>3</sup> .....	.727	...	.750	...	.777	...

<sup>1</sup> Earliest available month is October 1973.

<sup>2</sup> Earliest available month is January 1976 (\$0.696).

<sup>3</sup> The U.S. city average in April, 1978 was \$0.627 for leaded regular, \$0.667 for unleaded regular, and \$0.687 for premium gasoline. Among the 23 metropolitan areas surveyed monthly, Honolulu ranked first for all three types of gasoline.

Source: U.S. Bureau of Labor Statistics, *Retail Prices and Indexes of Fuels and Utilities, Residential Usage* (monthly).

**Table 289.—ENERGY USED IN AGRICULTURE: 1974**

Subject	Units	Amounts
All energy used .....	Billion BTU's	6,511
Crops .....	Billion BTU's	6,214
Sugar cane .....	Billion BTU's	4,667
Pineapples .....	Billion BTU's	345
Other and unspecified .....	Billion BTU's	1,202
Livestock .....	Billion BTU's	297
Gasoline .....	1,000 gallons	8,976
Diesel .....	1,000 gallons	6,493
Fuel oil .....	1,000 gallons	40
LP gas .....	1,000 gallons	173
Natural gas .....	1,000 MCF	—
Coal .....	Tons	—
Electricity .....	Million KWH's	707
Invested <sup>1</sup> .....	Billion BTU's	2,043
Irrigation, total .....	Billion BTU's	2,465
Gasoline .....	1,000 gallons	723
Electricity .....	Million KWH's	696
Fertilizers, total .....	Billion BTU's	1,882
Nitrogen .....	1,000 lbs. <sup>2</sup>	52,944
Phosphate .....	1,000 lbs. <sup>2</sup>	22,835
Potash .....	1,000 lbs. <sup>2</sup>	25,407
Pesticides, total .....	Billion BTU's	161
Herbicide .....	1,000 lbs. <sup>3</sup>	857
Insecticide .....	1,000 lbs. <sup>3</sup>	595
Fungicide and other .....	1,000 lbs. <sup>3</sup>	—

<sup>1</sup> Energy required to manufacture fertilizers and pesticides (including carrier solution).

<sup>2</sup> Of (N), (P2O5), and (K2O).

<sup>3</sup> Of active ingredient.

Source: Federal Energy Administration, *Energy and U. S. Agriculture: 1974 Data Base*, Vol. 1 (September 1976), pp. 69-72.

**Table 290.—SCIENTIFIC ORGANIZATIONS AND RESOURCES: 1976**

Type of organization	Number of organizations	Employment		
		Total	Professional	Technical
Total employing organizations .....	384	34,449	7,346	10,729
Organizations with scientific capabilities .....	98	14,528	2,447	3,253
Computer science companies .....	54	2,510	697	1,096
R & D and allied companies .....	43	1,541	453	400
Testing laboratories .....	31	1,060	305	288
Private research agencies .....	39	778	299	118
Government agencies .....	119	14,032	3,145	5,574
Federal civilian .....	24	1,424	257	715
Military .....	10	6,118	676	3,705
State, except University of Hawaii .....	36	3,218	1,087	613
University of Hawaii .....	33	1,497	756	294
County .....	16	1,775	369	247

  

Subject	Number	Subject	Number
Professional associations:		Colleges and universities:	
Number of associations .....	44	Number of units .....	34
Regular membership .....	11,749	Full-time enrollment <sup>1</sup> .....	37,770
Associate membership .....	753	Part-time enrollment <sup>1</sup> .....	38,805
Scientific libraries:		Business and technical schools:	
Number of libraries .....	22	Number of units .....	4
Number of scientific books .....	846,436	Full-time enrollment <sup>1</sup> .....	763
		Part-time enrollment <sup>1</sup> .....	162

<sup>1</sup>Spring 1976. Because of differences in coverage and definition, these data differ from those in Section 3  
Source: Hawaii State Department of Planning and Economic Development, *Hawaii's Scientific Resources, 1977 Directory*, 8th edition (1977), p. 5.

**Table 291.—PATENTS GRANTED TO HAWAII  
RESIDENTS: 1970 TO 1977**

Year	Patents
1970 .....	50
1971 .....	37
1972 .....	26
1973 .....	50
1974 <sup>1</sup> .....	55
1975 <sup>1</sup> .....	61
1976 .....	51
1977 .....	43

<sup>1</sup> Fiscal year ended June 30. Includes reissues.  
Source: *Annual Report of the Commissioner of Patents*;  
U.S. Department of Commerce, Patent and Trademark  
Office, records.