

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 six billion kilowatt-hours in 1978, or 7,347 per residential customer. The total has doubled since 1968. Manufactured gas sales reached 34.9 million therms in 1978, 48 percent above the figure ten years earlier. Residential rates in 1978 averaged 5.9 cents per kilowatt-hour and 92 cents per therm, both well above the corresponding rates several years earlier.

The liquid fuel tax base for 1978 was approximately 917 million gallons, compared with 825 million in 1974 and 620 million in 1968. The 1978 total included 325 million gallons of gasoline, 473 million of aviation fuel, and 115 million of diesel oil. The average price for leaded premium gasoline rose from 48.7 cents per gallon in October 1973 to 93.1 cents in May 1979.

Total energy consumption in 1975 amounted to 209 trillion British thermal units, compared with 134 trillion BTU a decade earlier. Transportation accounted for 60 percent of the 1975 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-one patents were granted to Hawaii residents in 1978.

Information on communications, energy and science can be obtained from reports and records of the U.S. Department of Energy, 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. Historical Statistics of Hawaii, Section 19, presents data for earlier years. Data for the nation as a whole can be found in the Statistical Abstract of the United States: 1978, Sections 20 and 21.

Table 260.-- ELECTRIC UTILITIES: 1968 TO 1978

Year	Customers, Dec. 31			Installed capacity, Dec. 31 (kW)	Power sold (1,000 kWh)		
	Total	Residential	Other		Total	Residential	Other
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
1978 ..	284,064	244,863	39,201	1,487,490	6,004,891	1,799,024	4,205,867
Year	Average annual use (kWh) <u>1/</u>		Average rate (dollars per kWh)		Revenues (\$1,000)		
	Residential	Other	Residential	Other	Total	Residential	Other
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
1978 ..	7,347	107,290	.05883	.04943	313,722	105,846	207,876

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

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

Table 261.-- ELECTRIC UTILITIES, BY ISLANDS: 1978

County or island	Customers, Dec. 31			Installed capacity, Dec. 31 (kW)	Power sold (1,000 kWh)		
	Total	Residential	Other		Total	Residential	Other
State total	284,064	244,863	39,201	1,487,490	6,004,891	1,799,024	4,205,867
Oahu	209,907	183,519	26,388	1,209,400	5,025,540	1,425,647	3,599,893
Hawaii	31,979	26,303	5,676	124,300	393,521	161,204	232,317
Kauai	14,526	12,186	2,340	62,080	179,299	63,495	115,804
Maui County	27,652	22,855	4,797	91,710	406,531	148,678	257,853
Lanai	853	682	171	-	6,057	3,576	2,481
Maui	24,755	20,563	4,192	85,210	375,867	134,508	241,359
Molokai	2,044	1,610	434	6,500	24,607	10,594	14,013
County or island	Average annual use (kWh) <u>1/</u>		Average rate (dollars per kWh)		Revenues (\$1,000)		
	Residential	Other	Residential	Other	Total	Residential	Other
State total	7,347	107,290	0.05883	0.04943	313,722	105,846	207,876
Oahu	7,768	136,422	0.05485	0.04530	241,267	78,198	163,069
Hawaii	6,129	40,930	0.07535	0.07140	28,733	12,146	16,587
Kauai	5,210	49,489	0.08601	0.08628	15,453	5,462	9,991
Maui County	6,505	53,753	0.06752	0.07070	28,269	10,040	18,229
Lanai	5,243	14,511	0.07380	0.08330	471	264	207
Maui	6,541	57,576	0.06643	0.06874	25,526	8,936	16,590
Molokai	6,580	32,288	0.07926	0.10222	2,272	840	1,432

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

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

Table 262.— SERVICE PROVIDED BY HAWAIIAN ELECTRIC CO., INC., ON OAHU: 1970 TO 1978

Year	Number of customers, December 31		Net input <u>1/</u> (1,000 KWH)	Power sold (1,000 KWH)	Average annual residential use (KWH)	Average residential rate <u>2/</u> (dollars per KWH)	Installed capacity <u>3/</u> (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
1978	209,907	183,519	5,331,724	5,025,540	7,875	0.05485	1,140,180

1/ Net generated plus purchased power.

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

3/ Maximum generator nameplate.

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

Table 263.-- GAS UTILITIES: 1968 TO 1978

[Excludes bottled gas]

Year	Customers, Dec. 31			Gas sold (1,000 therms)		
	Total	Residen- tial	Other	Total	Residen- tial	Other
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	4,629	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 <u>2/</u> ..	33,722	29,408	4,314	34,844	7,612	27,232
1978 <u>2/</u> ..	33,413	29,091	4,322	34,919	7,388	27,532

Year	Average annual use (therms) <u>1/</u>		Average rate (dollars per therm)		Revenues (\$1,000)		
	Residen- tial	Other	Residen- tial	Other	Total	Residen- tial	Other
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 <u>2/</u> ..	259	6,313	.85883	.65821	24,462	6,537	17,925
1978 <u>2/</u> ..	254	6,370	.91647	.71792	26,536	6,770	19,766

1/ Based on number of customers at end of year.2/ Data provided by Gasco, Inc., differ slightly from the Public Utilities Division data shown here.

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

Table 264.-- GAS UTILITIES, BY ISLANDS: 1978

[Excludes bottled gas]

Island	Customers, Dec. 31			Gas sold (therms)		
	Total	Residen- tial	Other	Total	Residen- tial	Other
State total ..	33,413	29,091	4,322	34,919,266	7,387,530	27,531,736
Oahu	30,659	26,726	3,933	31,841,635	6,799,646	25,041,989
Hawaii	2,126	1,799	327	2,373,192	442,880	1,930,312
Kauai	232	232	-	63,940	63,940	-
Maui	396	334	62	640,499	81,064	559,435

Island	Average annual use (therms) <u>1/</u>		Average rate (dollars per therm)		Revenues (\$1,000)		
	Residen- tial	Other	Residen- tial	Other	Total	Residen- tial	Other
State total ..	254	6,370	0.91647	0.71792	26,536	6,770	19,766
Oahu	254	6,367	0.92925	0.72925	24,580	6,318	18,262
Hawaii	246	5,903	0.77446	0.60164	1,504	343	1,161
Kauai	276	-	0.80996	-	52	52	-
Maui	243	9,023	0.70489	0.61212	400	57	343

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

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

Table 265.-- GAS UTILITY SERVICE BY GASCO, INC., FOR OAHU: 1970 TO 1978

Calendar year	Customers, Dec. 31		Gas sold <u>1/</u> (1,000 therms)		Average annual residential usage <u>1/</u> (therms)
	Total	Residential	Total	Residential	
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
1978	30,659	26,722	31,842	6,797	254

1/ Includes liquefied petroleum gas.
Source: Gasco, Inc., records.

Table 266.-- BOILERS AND PRESSURE VESSELS: DECEMBER 31, 1978

Island	Power boilers	Heating boilers	Pressure vessels <u>1/</u>
State total	676	2,519	4,517
Hawaii	89	234	673
Maui	59	187	362
Lanai	3	2	24
Molokai	5	29	27
Oahu	468	1,949	3,187
Kauai	52	118	244

1/ Five cubic feet or more. The 1977 figures reported in The State of Hawaii Data Book 1978, table 282, were later revised to 4,302 for the State and 332 for Maui.

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

Table 267.— TYPICAL RESIDENTIAL UTILITY MONTHLY RATES, BY ISLAND:
JANUARY 1979

[In dollars]

Utility and monthly use	Oahu	Hawaii <u>1/</u>	Kauai	Maui	Molokai	Lanai
Water:						
5/8-inch meter, 5,000 gal.	5.70	5.90	4.50	5.65	5.65	2.95
5/8-inch meter, 10,000 gal.	7.55	8.55	7.00	8.30	8.30	4.65
1-inch meter, 20,000 gal.	13.50	16.85	15.00	19.55	19.55	9.30
1 1/2-inch meter, 50,000 gal.	28.10	37.50	35.00	44.75	44.75	22.00
Electricity: <u>2/</u>						
250 kilowatt-hours	18.27	25.11	26.11	21.16	29.45	21.76
500 kilowatt-hours	30.49	40.02	46.06	35.11	48.40	36.33
750 kilowatt-hours	42.81	54.93	65.40	49.12	67.70	50.94
1,000 kilowatt-hours	55.53	70.34	84.74	63.62	87.70	66.06
Gas:						
10 therms	12.19	9.56	9.35	8.02	...	...
25 therms	24.84	19.96	20.47	17.61	...	...
50 therms	46.67	36.59	38.54	33.36	...	...
100 therms	91.32	70.19	74.89	65.16	...	...
Telephone: <u>3/</u>						
Individual line	11.40	10.20	9.70	9.70	8.30	7.50
Two-party line	9.35	8.55	8.20	8.20	7.05	6.40

1/ Water rates are those for South Hilo, North and South Kohala, and Ka'u Districts; for other districts, add \$0.12 per 1,000 gallons. Gas rates are those for South Hilo.

2/ Includes fuel adjustment surcharge.

3/ Excludes Federal excise tax (3 percent for 1979).

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 268.-- LIQUID FUEL TAX BASE: 1968 TO 1978

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

Year reported <u>1/</u>	All types	Gasoline	Diesel oil		Liq. pet. gas		Aviation fuel	Small boats	
			Non-hwy.	Hwy. use	Off-hwy.	Hwy. use		Gasoline	Diesel oil
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
1978	917,380	324,702	99,755	15,233	1,821	1,216	473,270	445	938

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1/ 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 ended November 30.

Source: Hawaii State Department of Taxation, "Liquid Fuel Tax Base, Collections & Distribution" (annual report).

Table 269.-- DOMESTIC DEMAND FOR PETROLEUM PRODUCTS: 1976

[Barrels daily]

Item	Total	Military <u>1/</u>	All other
Total petroleum	90,363	2,642	87,721
Liquified gases	1,128	-	1,128
Fuel uses	1,128	-	1,128
Other	-	-	-
Gasoline	19,891	596	19,295
Motor	19,637	596	19,041
Aviation	254	-	254
Special naphthas and solvents	112	-	112
Jet fuel	29,811	1,705	28,106
Naphtha-type	1,694	1,694	-
Kerosine-type	28,117	11	28,106
Kerosine	246	8	238
Distillate fuel oil	6,571	333	6,238
Lubricating oils and greases	276	-	276
Residual fuel oil	30,664	-	30,664
Asphalt and road oil	1,128	-	1,128
All other finished and unfinished oils	-	-	-
Still gas	536	-	536

1/ 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 270.-- GROSS ENERGY CONSUMPTION, BY KIND OF FUEL: 1960 TO 1975

Year	Gross energy consumption (trillions of Btu)	Gasoline (millions of gallons)	Distillate oil and kerosene (millions of barrels)	Diesel fuel (millions of barrels)	Residual oil (millions of barrels)
1960 ...	100.27	219.26	0.49	0.48	5.61
1961 ...	119.07	240.50	1.26	0.48	6.65
1962 ...	111.12	182.45	1.23	0.46	6.72
1963 ...	118.12	170.64	1.01	0.42	6.94
1964 ...	127.49	169.07	1.37	0.44	7.54
1965 ...	134.23	180.21	1.11	0.56	7.67
1966 ...	147.73	195.51	0.84	0.56	8.27
1967 ...	166.68	210.75	0.65	0.58	8.72
1968 ...	185.88	209.14	0.81	0.60	9.73
1969 ...	193.92	221.63	0.90	0.71	10.00
1970 ...	198.51	242.44	1.32	0.53	10.16
1971 ...	208.35	252.46	1.18	0.61	10.63
1972 ...	212.28	268.25	1.08	0.60	11.32
1973 ...	217.91	285.08	1.22	0.66	11.58
1974 ...	206.37	275.91	1.23	0.74	11.22
1975 ...	208.86	287.74	2.00	0.64	10.73

Year	Liquid petroleum gas (millions of gallons)	Jet fuel (millions of gallons)	Natural gas (billions of cu. ft.)	Coal (millions of short tons)	Nuclear and hydro electricity (billions of kWh)	Other fuels (trillions of Btu)
1960 ...	4.70	216.44	-	-	-	3.66
1961 ...	5.86	245.51	-	-	-	4.89
1962 ...	7.21	238.73	-	-	-	4.81
1963 ...	9.71	300.12	-	-	0.02	4.86
1964 ...	10.87	320.80	-	-	0.03	5.40
1965 ...	9.19	358.51	-	-	0.02	6.07
1966 ...	10.14	426.25	-	-	0.03	6.27
1967 ...	11.95	542.93	-	-	0.02	6.05
1968 ...	12.48	628.15	-	-	0.02	6.83
1969 ...	38.30	633.19	-	-	0.02	7.19
1970 ...	39.46	622.28	-	-	0.02	7.95
1971 ...	40.46	672.85	-	-	0.02	7.17
1972 ...	39.69	655.93	-	-	0.02	7.71
1973 ...	39.54	659.87	-	-	0.02	7.83
1974 ...	40.56	597.07	-	-	0.02	7.39
1975 ...	36.61	598.22	-	-	0.02	7.86

Source: U.S. Department of Energy, Energy Information Administration, Federal Energy Data System (FEDS), Statistical Summary, February 1978, pp. 150-151.

Table 271.-- ENERGY CONSUMPTION, BY FUEL AND CONSUMING SECTOR: 1975

[In trillions of Btu]

Fuel	All sectors	Electric utilities	Residential	Commercial	Industrial	Transportation
All fuels <u>1/</u>	208.86	58.58	8.06	7.60	27.46	125.50
Gasoline	35.95	-	-	0.52	0.28	35.15
Excluding aviation	35.60	-	-	0.52	0.28	34.80
Aviation	0.35	-	-	-	-	0.35
Distillate oil and kerosene	11.63	5.99	0.99	0.01	1.19	5.02
Diesel fuel	3.74	-	-	-	2.18	-
Residual oil	67.43	52.40	-	0.57	7.92	6.55
Liquid petroleum gas <u>2/</u>	3.50	-	1.36	0.15	1.95	0.22
Jet fuel	78.55	-	-	-	-	78.55
Natural gas	-	-	-	-	-	-
Coal and coke	-	-	-	-	-	-
Nuclear and hydro electricity	0.20	0.20	-	-	-	-
Electricity purchased <u>1/</u> ...	-	-	5.70	3.78	8.67	-
Asphalt and road oil	2.58	-	-	2.58	-	-
Feedstocks	5.28	-	-	-	5.28	-
Electric sales	18.15	18.15	-	-	-	-

1/ Total for all sectors excludes electricity purchased.2/ Detail does not add to indicated total, for unstated reason.Source: U.S. Department of Energy, Energy Information Administration, Federal Energy Data System (FEDS), Statistical Summary, February 1978, pp. 151, 293, 435, 577, 719, and 861.

Table 272.-- BUNKER OIL LADEN IN HONOLULU CUSTOMS DISTRICT ON VESSELS
ENGAGED IN FOREIGN TRADE: 1977 AND 1978

[In barrels of 42 gallons]

Year	Total	American vessels		Foreign vessels	
		Fuel oil	Diesel oil	Fuel oil	Diesel oil
1977 ...	1,728,413	241,964	35,068	376,207	1,075,174
1978 ...	2,049,939	261,467	18,943	632,127	1,137,402

Source: U.S. Bureau of the Census, United States Foreign Trade, Bunker Fuels, Annual 1977 (FT810-77-13, May 1978) and Annual 1978 (FT810-78-13, July 1979).

Table 273.-- AVERAGE PRICE PER GALLON FOR GASOLINE, FOR URBAN OAHU:
1973 TO 1979

[In dollars. Average prices include all applicable taxes.]

Year	Leaded regular gasoline <u>1/</u>		Unleaded regular gasoline <u>2/</u>		Premium gasoline <u>1/</u>	
	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 <u>3/</u> .....	.727	.771	.750	.781	.777	.812
1979 <u>3/</u> .....	.851	...	.875	...	.899	...

1/ Earliest available month is October 1973.

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

3/ Data for July 1978 and later not directly comparable to earlier data.

Source: U.S. Bureau of Labor Statistics, Retail Prices and Indexes of Fuels and Utilities, Residential Usage (monthly, through June 1978) and records.

Table 274.-- QUANTITY AND COST OF PURCHASED FUELS AND ELECTRIC ENERGY
USED FOR HEAT AND POWER BY MANUFACTURING INDUSTRIES: 1976

Type of fuel or energy	Quantity, all mfg. industries		Cost (million dollars)	
	Unit	Amount	Total, all mfg. industries	Food and kindred products
Purchased fuels and electric energy	Trillion Btu's	9.6	27.8	15.3
Purchased fuels	Trillion Btu's	8.1	15.4	10.3
Distillate fuel oil	1,000 barrels	280.3	3.4	3.1
Residual fuel oil	1,000 barrels	798.3	10.0	6.0
Coal and coke	1,000 short tons	-	-	-
Natural gas	Billion cubic feet	0.6	0.5	0.3
Other fuels .....	. . .	...	1.0	0.8
Fuels not specified by kind ...	. . .	...	0.5	0.1
Electric energy:				
Purchased	Million kWh	433.9	12.4	5.1
Generated less sold	Million kWh	315.4	...	...

Source: U.S. Bureau of the Census, Annual Survey of Manufactures 1976; Fuels and Electric Energy Consumed, M76 (AS)-4.2, pages 106-107.

Table 275.-- 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
Organization 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 <u>1</u> /	37,770
Associate membership	753	Part-time enrollment <u>1</u> /	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 <u>1</u> /	763
		Part-time enrollment <u>1</u> /	162

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1/ 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 276.-- FEDERAL R&D OBLIGATIONS:
1965 TO 1976

Year	Millions of dollars
1965	41.5
1971	38.3
1975	43.0
1976	45.5

Source: National Science Foundation, Federal Funds for Research, Development, and Other Scientific Activities, Fiscal Years 1976, 1977, and 1978 (Surveys of Science Resources Series, NSF 78-300, Vol. XXVI), p. 36.

Table 277.-- PATENTS GRANTED TO HAWAII
RESIDENTS: 1970 TO 1978

Year	Patents
1970	50
1971	37
1972	26
1973	50
1974 <u>1/</u>	55
1975 <u>1/</u>	61
1976	51
1977	43
1978	41

1/ 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.