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Pollution Abatement and Control Expenditures, 1972-79

REAL spending for pollution abatement and control (PAC) increased 1½ percent in 1979, compared with 5 percent in 1978 and an average annual rate of 6 percent during 1972–78. Air PAC spending increased 2½ percent in 1979, and water PAC spending decreased 1½ percent. Spending for solid waste collection and disposal increased 6 percent. Additional highlights are:

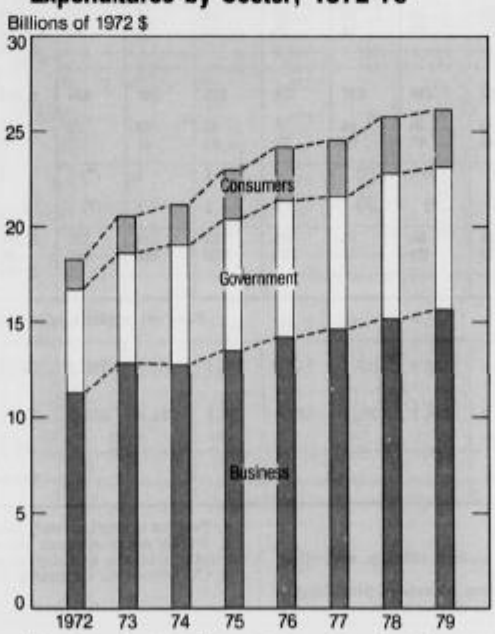
- Real spending for PAC amounted to $26.1 billion (1972 dollars) in 1979.
- Prices for PAC goods and services increased more in 1979 than in any year since 1974.
- Business was the only sector with a real spending increase in 1979. Government spending declined 2 percent, and personal consumption was unchanged (chart 4).
- Real spending by government enterprises for sewer systems, the largest single component of PAC, decreased 3½ percent in 1979, compared with a 14½ percent increase in 1978.

This article discusses real spending for PAC and prices in 1979, evaluates the limited data for 1980 available as of mid-March, presents revised estimates of spending for 1972–78, and analyses trends in real spending for 1972–79. PAC expenditures are for reducing the emission of pollutants and for the collection and disposal of solid wastes by means acceptable to Federal, State, and local authorities. PAC expenditures consist of those for pollution abatement (PA), which reduce emissions directly, and for regulation and monitoring and for research and development, which lead indirectly to the reduction of emissions. Other aspects of environmental protection, such as expenditures for conservation of natural resources and the protection of endangered species, are excluded. Pollutants are substances (and forms of energy such as noise) that degrade the quality of air and water shared by all.

PAC expenditures are classified in table 1 (p. 21) by type (e.g., water PAC). For each type, detail is shown for functions (e.g., research and development), sectors (e.g., business), and accounting categories (e.g., on capital account). Because data are not available, the estimates exclude spending for PAC performed during agricultural production of crops and livestock except in feedlots. Table 2 (p. 20) shows additional detail for business and government expenditures for air and water PA using the same framework as table 1; additional detail for air and water PAC other than PA are not available. Table 3 shows price changes for total PAC expenditures and selected components. Table 4 shows Federal grants to State and local governments for PAC. Table 5 shows sources of the revisions in PAC expenditures. Tables 6 and 7 show air and water PA expenditures according to sources of emissions; sources are classified generally as mobile, stationary, point, and nonpoint. Table 8 shows spending for aspects of solid waste management, which includes but is not confined to collection and disposal by means acceptable to public authorities.

CHART 4

Pollution Abatement and Control Expenditures by Sector, 1972-79



Note.—Data are from table 1. Business is the sum of lines 28 and 42; government, lines 34, 38, 43, and 44; consumers, line 25.

U.S. Department of Commerce, Bureau of Economic Analysis 81-3-4

Real PAC spending in 1979.—Real spending for PAC increased $0.3 billion in 1979, one-quarter the increase in 1978. Spending for air PAC and for solid waste collection and disposal increased, water PAC spending decreased, and "other and unallocated" spending did not change significantly.

Air PAC spending increased $0.3 billion in 1979. Business spending for air PA accounted for all of this increase; small changes in other air PAC spending were offsetting. Both capital-account spending (for goods such as equipment) and current-account spending (for other goods and services such as fuel and labor) increased significantly. Water PAC spending decreased $0.2 billion in 1979. Government capital spending for water PA (public sewer systems and other government enterprise fixed capital) accounted for most of the decrease. Business spending for water PA was essentially unchanged; decreased capital-account spending offset increased

Table 2.—Business and Government Expenditures for Air and Water Pollution Abatement in Current and Constant (1972) Dollars and Selected Implicit Price Deflators

	Air								Water							
	1972 r	1973 r	1974 r	1975 r	1976 r	1977 r	1978 r	1979 p	1972 r	1973 r	1974 r	1975 r	1976 r	1977 r	1978 r	1979 p
Millions of current dollars																
Business (line 6) [1]	4,056	5,336	6,369	8,667	9,103	9,716	10,958	12,909	4,152	5,638	6,244	7,202	8,484	9,596	10,735	11,996
On capital account (line 7)	2,588	3,296	3,806	4,819	4,804	4,922	5,212	5,592	2,621	3,116	3,272	3,421	4,227	4,557	4,938	5,151
Motor vehicle emission abatement	225	329	444	770	963	1,168	1,252	1,527								
Plant and equipment expenditures [2]	2,307	2,947	3,362	4,045	3,841	3,753	3,960	4,065	1,358	1,743	1,947	2,558	2,983	3,096	3,081	3,108
Residential systems [3]									1,260	1,369	1,319	1,000	1,236	1,553	1,837	2,048
Agricultural business [4]									3	3	7	7	8	8	5	3
On current account (line 8)	1,532	2,062	3,063	3,739	4,299	4,795	5,646	7,368	2,132	2,523	3,032	3,581	4,254	5,040	5,812	6,814
Private (line 9)	1,612	2,092	2,995	3,679	4,227	4,777	5,546	6,966	1,004	1,206	1,465	1,731	2,093	2,474	2,815	3,253
Motor vehicle emission abatement	435	610	1,060	1,294	1,492	1,650	1,812	2,149								
Manufacturing establishments	744	912	960	1,200	1,408	1,769	2,131	2,476	572	696	845	1,021	1,246	1,496	1,702	2,048
Privately owned electric utility establishments	229	373	706	853	911	896	1,037	1,163	32	35	54	63	91	102	115	130
Other nonmanufacturing establishments	204	237	269	332	416	492	566	480	205	261	335	396	435	550	672	821
Residential systems [3]									195	211	229	247	268	292	338	351
Agricultural business [4]									(*)	1	1	2	2	3	4	5
Government enterprise (line 10)	20	30	68	60	72	78	102	120	1,128	1,318	1,577	1,850	2,161	2,567	2,997	3,460
Publicly owned electric utilities	20	30	68	60	72	78	102	120	4	6	5	7	8	12	20	32
Public sewer systems [5]									1,124	1,311	1,571	1,843	2,153	2,554	2,977	3,428
Other									(*)	1	1	(*)	1	(*)	1	1
Government (line 12)	142	129	161	199	259	299	284	340	3,465	3,944	4,683	5,768	6,362	6,462	7,975	8,636
Federal (line 13)	68	47	58	88	105	108	87	103	75	123	196	271	257	280	300	245
Federal, excl. highway erosion abatement	68	47	58	88	105	108	87	103	70	120	192	268	243	274	294	238
Highway erosion abatement									5	5	4	5	6	6	7	7
State and local (line 14)	(*)	(*)	(*)	1	1	1	1	(*)	171	171	189	210	204	189	212	226
State and local excl. highway erosion abatement	(*)	(*)	(*)	1	1	1	1	(*)								
Highway erosion abatement									171	171	189	210	204	189	212	226
Government enterprise fixed capital (line 15)	86	82	104	102	154	192	196	236	3,228	3,650	4,499	5,287	5,891	6,494	7,464	8,064
Publicly owned electric utilities	86	82	104	102	154	192	196	236	20	58	78	64	78	78	98	97
Public sewer systems [5]									3,208	3,403	4,421	5,223	5,818	6,416	7,366	7,967
Millions of constant (1972) dollars																
Business (line 28)	4,056	4,900	5,037	5,763	5,340	5,018	5,054	5,315	4,152	5,382	5,180	5,247	5,753	5,977	6,215	6,196
On capital account (line 29)	2,588	3,143	3,156	3,410	3,443	3,391	3,330	3,445	2,621	2,942	2,889	2,756	3,012	3,023	3,080	3,040
Motor vehicle emission abatement	225	339	419	670	757	900	975	1,021								
Plant and equipment expenditures [2]	2,307	2,804	2,737	2,940	2,686	2,492	2,355	2,425	1,358	1,638	1,610	1,848	2,151	2,025	1,919	1,753
Residential systems [3]									1,260	1,301	1,274	905	857	993	1,057	1,085
Agricultural business [4]									3	3	5	6	5	5	3	2
On current account (line 30)	1,532	1,847	1,901	2,158	2,397	2,487	2,724	2,870	2,132	2,377	2,411	2,491	2,741	2,954	3,208	3,456
Private (line 31)	1,612	1,922	1,879	2,165	2,346	2,454	2,685	2,838	1,004	1,134	1,142	1,181	1,332	1,435	1,620	1,680
Motor vehicle emission abatement	435	580	780	860	935	976	1,068	1,116								
Manufacturing establishments	744	741	670	735	843	899	968	1,039	572	655	648	671	760	817	891	927
Privately owned electric utility establishments	229	308	335	386	343	385	389	385	32	33	41	39	53	54	57	59
Other nonmanufacturing establishments	204	206	189	203	249	246	266	257	205	245	247	259	293	314	350	389
Residential systems [3]									195	201	207	211	215	218	220	223
Agricultural businesses [4]									(*)	(*)	1	1	2	2	2	2
Government enterprise (line 32)	20	25	23	24	29	33	38	40	1,128	1,248	1,268	1,309	1,417	1,548	1,688	1,770
Publicly owned electric utilities	20	25	23	24	29	33	38	40	4	6	4	5	5	7	10	14
Public sewer systems [5]									1,124	1,237	1,264	1,304	1,412	1,541	1,670	1,755
Other									(*)	1	1	(*)	(*)	(*)	(*)	(*)
Government (line 34)	142	139	130	137	170	158	184	189	3,465	3,885	4,134	4,615	4,762	4,478	5,063	4,905
Federal (line 35)	68	45	46	68	70	55	49	50	75	124	166	216	190	196	188	185
Federal, excl. highway erosion abatement	68	45	46	68	70	55	49	50	70	120	163	212	186	189	185	181
Highway erosion abatement									5	4	3	3	4	4	3	3
State and local (line 36)	(*)	(*)	(*)	(*)	1	1	1	(*)	171	155	137	147	142	117	108	101
State and local excl. highway erosion abatement	(*)	(*)	(*)	(*)	1	1	1	(*)								
Highway erosion abatement									171	155	137	147	142	117	108	101
Government enterprise fixed capital (line 37)	86	78	84	73	105	122	138	136	3,228	3,405	3,832	4,252	4,430	4,165	4,776	4,619
Publicly owned electric utilities	86	78	84	73	105	122	138	136	20	54	61	45	49	48	59	55
Public sewer systems [5]									3,208	3,352	3,771	4,206	4,381	4,118	4,717	4,557
Selected implicit price deflators [6]																
Plant and equipment expenditures (see above, business, capital account) [6]	100.0	105.1	122.8	137.7	144.7	154.8	168.9	180.0	100.0	106.4	120.9	131.2	138.7	147.0	160.5	175.9
Manufacturing, privately owned electric utilities, and other non-manufacturing establishments (see above, business, current account)	100.0	112.4	176.1	187.1	190.0	219.8	234.8	252.6	100.0	106.8	130.9	153.0	184.5	163.8	194.6	221.8
Public sewer systems (see above, business, current account) [5]									100.0	106.0	124.8	141.2	152.4	165.6	177.6	185.2
Public sewer systems (see above, government, fixed capital) [6]									100.0	107.5	117.2	124.1	132.5	142.3	155.2	174.8

r Revised. p Preliminary. *Less than $500,000.

1. Line numbers correspond to those in Table 1.
2. Consists of manufacturing, private and cooperatively-owned electric utilities, and other nonmanufacturing companies.
3. Consists of private septic systems and sewer connections linking household plumbing to street sewers.
4. Feedlot operations only, see footnote 1 on table 1.
5. Public sewer systems consist of treatment plants, collection sewers, interceptor sewers, pumping stations, and dry waste disposal plants.
6. Current-dollar estimates divided by constant (1972) dollar estimates.

current-account spending. Spending for solid waste collection and disposal increased $0.2 billion in 1979. Business spending accounted for virtually all this increase; both capital-account and current-account spending increased but the increase was largely on current-account.

The largest single increase was in business current-account spending for solid waste collection and disposal. The increase reflects increased intensity of use of trucks and facilities, an increase in the gross stock of trucks and facilities, and increased precaution during collection and disposal (e.g., separation of types of waste for special handling). Rules and guidelines, which were mandated by the Resource Conservation and Recovery Act of 1976, have been under development for several years and are being made final in phases. They began to be proposed and published for public comment in early 1978 and a few

Table 1.—Expenditures for Pollution Abatement and Control in Current and Constant (1972) Dollars and Selected Implicit Price Deflators [1]

Line		1972 [r]					1973 [r]					1974 [r]				
		Total	Air	Water	Solid waste	Other and unallocated [2]	Total	Air	Water	Solid waste	Other and unallocated [2]	Total	Air	Water	Solid waste	Other and unallocated [2]
		Millions of current dollars														
1	Pollution abatement and control	18,220	8,536	8,523	3,406	−224	21,846	8,289	9,957	3,882	−285	26,258	10,477	11,527	4,447	−194
2	Pollution abatement [3]	17,031	5,843	8,237	3,394	−412	20,472	7,532	9,602	3,801	−463	24,675	9,098	11,128	4,385	−534
3	Personal consumption	1,536	1,536				2,065	2,065				2,667	2,667			
4	Durable goods	476	476				670	670				690	690			
5	Nondurable goods and services	1,060	1,060				1,395	1,395				1,977	1,977			
6	Business	10,722	4,185	4,732	2,220	−415	13,029	5,338	5,639	2,523	−470	15,510	6,669	6,244	2,944	−538
7	On capital account	5,451	2,533	2,621	298		6,760	3,269	3,115	376		7,470	3,805	3,212	453	
8	On current account	5,271	1,652	2,132	1,922	−415	6,269	2,052	2,523	2,155	−470	8,040	3,069	3,032	2,492	−538
9	Private	4,538	1,512	1,904	1,922		5,382	2,022	1,205	2,155		6,041	2,005	1,455	2,491	
10	Government enterprise	1,148	20	1,128	(*)	(*)	1,388	30	1,318	(*)	(*)	1,646	69	1,577	(*)	(*)
11	Costs recovered	−415				−415	−470				−470	−538				−538
12	Government	4,774	142	3,485	1,144	3	5,378	120	3,994	1,278	6	6,480	161	4,958	1,441	4
13	Federal	139	58	75	5	3	209	47	133	16	6	294	38	196	39	4
14	State and local	1,311	(*)	171	1,140	(*)	1,433	(*)	171	1,262	(*)	1,592	(*)	180	1,403	(*)
15	Government enterprise fixed capital	3,324	86	3,238			3,742	92	3,650			4,602	104	4,499		
16	Regulation and monitoring	367	143	144	14	66	480	165	190	18	117	595	183	247	27	138
17	Federal	200	48	79	9	64	278	50	99	14	115	346	53	135	22	136
18	State and local	167	95	66	5	2	212	115	91	4	2	249	131	112	5	(*)
19	Research and development	823	531	142	27	123	903	553	165	33	122	1,029	591	153	35	202
20	Private	519	411	64	12	32	589	451	70	13	35	608	492	57	13	46
21	Federal	205	104	34	6	62	260	126	82	11	60	342	100	78	17	148
22	State and local	99	17	44	10	28	85	6	33	9	18	39	7	18	5	9
		Millions of constant (1972) dollars														
23	Pollution abatement and control	18,220	8,536	8,523	3,406	−224	20,630	7,780	9,337	3,590	−177	21,112	7,988	9,679	3,656	−54
24	Pollution abatement [3]	17,031	5,843	8,237	3,394	−412	19,224	7,078	9,004	3,542	−401	19,755	7,309	9,234	3,597	−370
25	Personal consumption	1,536	1,536				1,965	1,965				2,116	2,116			
26	Durable goods	476	476				670	670				651	651			
27	Nondurable goods and services	1,060	1,060				1,295	1,295				1,465	1,465			
28	Business	10,722	4,185	4,732	2,220	−415	12,284	4,980	5,319	2,381	−407	12,101	5,067	5,100	2,415	−393
29	On capital account	5,451	2,533	2,621	298		6,437	3,143	2,942	353		6,227	2,186	2,686	382	
30	On current account	5,271	1,652	2,132	1,922	−415	5,846	1,847	2,377	1,999	−407	5,064	1,901	2,411	2,034	−383
31	Private	4,538	1,512	1,904	1,922		4,955	1,823	1,134	1,999		5,055	1,870	1,143	2,034	
32	Government enterprise	1,148	20	1,128	(*)	(*)	1,258	25	1,243	(*)	(*)	1,291	23	1,268	(*)	(*)
33	Costs recovered	−415				−415	−407				−407	−383				−383
34	Government	4,374	142	3,485	1,144	3	5,006	122	3,985	1,191	6	5,448	130	4,134	1,180	4
35	Federal	199	58	75	5	3	190	45	124	16	5	247	45	160	32	3
36	State and local	1,311	(*)	171	1,140	(*)	1,331	(*)	158	1,175	(*)	1,285	(*)	137	1,148	(*)
37	Government enterprise fixed capital	3,324	86	3,238			3,484	78	3,406			3,916	84	3,832		
38	Regulation and monitoring	367	143	144	14	66	456	154	178	17	109	518	157	215	23	122
39	Federal	200	48	79	9	64	261	47	93	14	108	300	46	119	20	122
40	State and local	167	95	66	5	2	197	107	85	2	2	212	112	96	4	(*)
41	Research and development	823	531	142	27	123	849	548	155	31	115	840	507	131	30	173
42	Private	519	411	64	12	32	534	424	60	13	33	519	415	48	11	39
43	Federal	205	104	34	6	62	253	118	69	11	65	294	86	67	15	126
44	State and local	99	17	44	10	28	61	6	31	8	17	34	6	18	4	5
		Selected implicit price deflators [4]														
45	Pollution abatement and control	100.0	100.0	100.0	100.0	100.0	106.5	106.4	106.5	107.3	112.2	124.4	131.5	120.3	121.6	129.5
46	Pollution abatement	100.0	100.0	100.0	100.0	100.0	106.5	106.4	106.0	107.3	115.3	124.0	132.8	120.5	121.9	140.4
47	Personal consumption	100.0	100.0				105.1	105.1				126.0	126.0			
48	Business	100.0	100.0	100.0	100.0	100.0	106.3	107.0	106.0	107.3	115.5	127.3	126.8	122.4	121.8	140.6
49	On capital account	100.0	100.0	100.0	100.0		105.1	104.5	105.9	104.2		120.0	120.6	119.6	118.4	
50	On current account	100.0	100.0	100.0	100.0	100.0	108.6	111.1	106.1	107.8	115.5	135.0	161.1	125.7	122.5	140.6
51	Government	100.0	100.0	100.0	100.0	100.0	107.3	105.0	107.0	107.4	100.7	110.1	123.5	118.1	122.1	117.1
52	Regulation and monitoring	100.0	100.0	100.0	100.0	100.0	107.0	107.3	106.0	106.5	106.7	114.8	115.0	114.9	116.1	113.4
53	Research and development	100.0	100.0	100.0	100.0	100.0	103.4	106.5	106.2	106.4	106.3	117.6	118.2	116.9	116.7	116.7
		Addendum: Business capital consumption allowance (Millions) [5]														
54	Valued at replacement cost in current dollars	1,324					1,620					2,111				
55	Valued at replacement cost in constant (1972) dollars	1,324					1,555					1,700				

[r] Revised.
[p] Preliminary.
[*] Less than $500,000.

1. Includes expenditures for air and water pollution abatement and control. Includes expenditures for solid waste collection and disposal by means acceptable to Federal, State, and local authorities. Excludes agricultural production of crops and livestock except feedlots.

2. "Other" includes expenditures for abatement and control of noise, radiation, and pesticide pollution; "unallocated" includes business expenditures not assigned to media.

3. Expenditures are attributed to the sector that performs the air or water pollution abatement or solid waste collection and disposal.

4. Current dollar estimates divided by constant (1972) dollar estimates.

5. To facilitate conversion of expenditures to a cost basis.

were made final in 1979. Increased precaution in 1979 was largely in preparation for forthcoming final rules and guidelines.

The largest single decrease was for the construction of public sewer systems (including municipal sewage treatment plants) and other government enterprise fixed capital, reflecting a reduced flow of Federal funds for such construction and reduced borrowing to finance construction. Federal grants for construction of treatment plants (see water PA, table 4) decreased in 1978 after increasing in 1977, as did State and local long-term borrowing for public sewer systems. Because of the time lag between financing and construction, the 1978 decreases and the 1977 increases both affected construction significantly in 1979, but the 1978 decreases had the predominant effect. Reduced borrowing in 1978 was largely due to increased long-term interest rates in 1978 and in early 1979.

Prices in 1979.—Prices of PAC goods and services, as measured by the implicit price deflator, increased 12.6 percent in 1979, compared with 7.4 percent in 1978. Prices of air PAC goods and services increased 15.1 percent, several percentage points more than for other types of PAC.

Table 1.—Expenditures for Pollution Abatement and Control in Current and Constant (1972)

Line		1975 r					1976 r					1977 r				
		Total	Air	Water	Solid waste	Other and unallocated [1]	Total	Air	Water	Solid waste	Other and unallocated [1]	Total	Air	Water	Solid waste	Other and unallocated [1]
		Millions of current dollars														
1	Pollution abatement and control	28,900	12,891	13,412	4,756	−217	34,665	14,249	15,337	5,249	−270	37,619	15,439	16,677	5,369	−375
2	Pollution abatement [2]	26,233	12,211	12,900	4,723	−660	32,604	13,357	14,993	5,232	−828	35,284	14,388	16,001	5,703	−895
3	Personal consumption	3,483	3,483				3,924	3,924				4,311	4,311			
4	Durable goods	1,361	1,361				1,821	1,821				2,166	2,166			
5	Nondurable goods and services	2,162	2,162				2,173	2,173				2,145	2,145			
6	Business	18,107	8,557	7,202	3,131	−002	20,249	9,103	8,481	3,562	−887	22,363	9,776	9,506	3,977	−947
7	On capital account	8,875	4,819	3,621	430		9,505	4,904	4,227	474		10,010	4,922	4,557	531	
8	On current account	9,322	3,739	3,581	2,004	−002	10,744	4,209	4,254	3,078	−887	12,353	4,856	5,040	3,490	−947
9	Private	8,105	3,679	1,731	2,004		9,307	4,227	2,093	3,077		10,600	4,777	2,374	3,445	
10	Government enterprise	1,010	60	1,850	(*)	1	2,234	72	2,161	(*)	1	2,646	78	2,507	(*)	1
11	Costs recovered	−003				−003	−887				−887	−058				−819
12	Government	7,573	190	5,768	1,591	23	8,151	290	6,323	1,081	59	8,580	290	6,403	1,817	62
13	Federal	423	88	271	60	23	472	106	257	52	59	401	106	280	43	62
14	State and local	1,762	1	210	1,541	(*)	1,834	1	204	1,029	(*)	1,003	1	180	1,774	(*)
15	Government enterprise fixed capital	5,380	102	5,287			6,045	154	5,891			6,130	192	5,934		
16	Regulation and monitoring	653	200	270	33	150	725	208	328	22	167	833	241	370	37	184
17	Federal	381	00	153	26	180	402	69	151	21	163	429	60	146	20	177
18	State and local	272	139	120	6	(*)	323	185	177	7	5	404	181	224	12	7
19	Research and development	1,104	653	164	42	316	1,268	659	177	40	391	1,404	612	207	30	436
20	Private	009	466	68	21	54	893	522	75	21	75	905	662	00	21	39
21	Federal	448	108	77	16	248	528	131	84	14	299	578	144	90	14	330
22	State and local	47	8	10	0	14	45	6	16	4	17	51	7	16	4	23
		Millions of constant (1972) dollars														
23	Pollution abatement and capital	22,941	9,100	10,212	3,705	−96	24,187	9,492	10,827	3,906	−56	24,503	9,638	10,659	4,067	−62
24	Pollution abatement [1]	21,570	8,403	9,801	3,051	−435	22,733	8,872	10,516	3,857	−511	22,917	8,911	10,453	4,054	−501
25	Personal consumption	2,580	2,580				2,857	2,857				2,945	2,945			
26	Durable goods	1,184	1,184				1,480	1,480				1,685	1,685			
27	Nondurable goods and services	1,406	1,405				1,368	1,368				1,262	1,262			
28	Business	12,978	5,768	6,217	2,419	−464	13,053	5,840	5,753	2,815	−566	13,996	5,818	6,077	2,708	−564
29	On capital account	6,001	3,010	2,758	325		6,791	3,443	3,012	336		6,703	3,391	3,023	340	
30	On current account	6,287	2,168	2,401	2,093	−464	6,802	2,397	2,741	2,270	−566	7,293	2,427	3,054	3,410	−564
31	Private	5,400	2,135	1,181	2,083		5,973	2,368	1,323	2,278		6,275	2,451	1,406	2,410	
32	Government enterprise	1,333	34	1,350	(*)	(*)	1,417	20	1,417	(*)	1	1,583	33	1,540	(*)	
33	Costs recovered	−465				−465	−566				−566	−564				−564
34	Government	4,003	137	4,015	1,233	10	5,234	176	4,703	1,242	44	5,076	188	4,470	1,289	43
35	Federal	334	53	210	36	10	341	70	100	38	44	331	56	183	30	42
36	State and local	1,313	(*)	147	1,106	(*)	1,347	1	142	1,204	(*)	1,387	1	117	1,230	(*) 1
37	Government enterprise fixed capital	4,326	73	4,252			4,535	105	4,430			4,289	122	4,166		
38	Regulation and monitoring	524	109	224	30	111	543	150	244	21	128	585	168	258	27	133
39	Federal	311	54	135	21	111	300	53	118	10	125	312	56	106	10	129
40	State and local	213	109	90	5	(*)	234	96	126	5	3	274	108	152	5	5
41	Research and development	847	444	127	33	244	911	479	128	20	284	1,002	510	130	26	296
42	Private	461	354	51	16	41	491	370	53	16	53	571	427	65	14	65
43	Federal	343	84	60	11	192	385	96	61	10	218	394	98	61	10	225
44	State and local	38	6	16	5	11	35	5	14	3	13	37	5	18	3	17
		Selected implicit price deflators [4]														
45	Pollution abatement and capital	135.1	142.8	131.3	128.3	140.9	143.8	149.8	140.9	135.7	148.7	153.5	159.9	152.8	148.6	168.3
46	Pollution abatement	133.5	143.5	131.5	129.3	151.3	143.4	150.5	141.1	135.7	158.0	151.9	160.7	153.1	148.6	168.2
47	Personal consumption	135.0	135.0				130.5	130.5				146.4	146.4			
48	Business	140.2	145.4	137.3	129.5	152.4	145.3	155.0	147.4	138.6	150.0	160.0	168.0	160.0	148.8	160.0
49	On capital account	132.6	133.5	131.4	134.1		140.0	140.5	140.3	141.1		149.3	147.7	150.8	152.1	
50	On current account	148.5	173.2	143.8	128.8	152.4	167.0	179.3	155.2	135.0	150.0	169.8	195.2	170.8	142.0	160.0
51	Government	125.2	130.5	123.0	120.1	123.3	134.2	147.5	133.4	135.3	133.0	143.6	156.1	143.0	143.1	145.6
52	Regulation and monitoring	124.6	120.1	124.8	123.3	122.3	133.4	135.1	134.2	132.3	130.0	142.4	144.1	143.7	140.8	138.2
53	Research and development	130.3	131.2	129.5	120.0	129.1	130.1	140.5	138.2	130.5	137.5	140.2	150.5	148.5	148.1	147.2
		Addendum: Business capital consumption allowance (Millions) [5]														
54	Valued at replacement cost in current dollars	2,649					3,214					3,830				
55	Valued at replacement cost in constant (1972) dollars	2,056					2,226					2,018				

See footnotes on page 21.

The chain price index and the fixed-weighted index increased at about the same rate as the implicit price deflator in 1979 (table 3). The implicit price deflator measures the average price of PAC purchases in each year. As a result, changes in the deflator measure not only changes in prices but also shifts in the composition of these purchases from year to year. In contrast, changes in the chain price index and the fixed-weighted index measure only changes in prices; the composition of purchases is held constant. The chain index is based on the composition of purchases in the preceding year and the fixed-weighted index is based on their composition in 1972. Compositional shifts had little effect on measures of price change in 1979.

Energy prices accounted for almost one-half of the acceleration of the fixed-weighted index in 1979. A fixed-weighted index of energy components of PAC increased more than three times the 1978 rate—29.1 percent compared with 6.2 percent. Energy purchases account for about one-tenth of total PAC purchases. A PAC fixed-weighted index that excludes all identifiable energy purchases accelerated much less—it increased 10.3 percent compared with 7.2 percent in 1978. Energy prices affected the prices of PAC goods other than energy to some extent but this is not taken into account in the result reported. Prices of PAC goods other than energy accelerated with few exceptions in 1979; prices of business capital for air PA accelerated more than prices of other goods except energy.

Dollars and Selected Implicit Price Deflators [1]—Continued

1978 [2]					1979 [2]					
Total	Air	Water	Solid waste	Other and unallocated [3]	Total	Air	Water	Solid waste	Other and unallocated	Line
Millions of current dollars										
42,445	18,969	19,350	6,427	−351	48,496	20,017	21,278	7,637	−436	1
39,654	18,790	18,711	6,480	−1,088	45,583	18,795	20,000	7,473	−1,186	2
4,649	4,649				5,475	5,475				3
2,412	2,412				2,741	2,741				4
2,237	2,237				2,734	2,734				5
24,128	10,858	10,735	4,305	−1,067	25,996	12,980	11,945	5,284	−1,233	6
10,710	5,212	4,923	570		11,796	5,893	5,151	752		7
14,212	5,640	5,812	3,820	−1,067	17,200	7,089	6,814	4,532	−1,233	8
12,120	5,545	2,918	3,820		14,653	6,969	3,353	4,532		9
3,008	102	2,997	(*)	1	3,581	120	3,460	(*)	(*)	10
−1,067				−1,067	−1,233				−1,233	11
10,333	284	7,976	2,034	39	11,212	340	8,035	2,189	48	12
484	87	300	45	28	636	102	345	50	42	13
2,202	1	212	1,060	(*)	2,372	(*)	226	2,146	5	14
7,080	196	7,464			8,202	238	8,004			15
945	377	407	50	211	1,044	289	412	104	241	16
587	94	197	27	199	684	101	238	37	228	17
438	189	220	22	13	482	188	175	67	32	18
1,557	903	231	47	476	1,749	953	266	60	490	19
987	735	107	28	116	1,068	814	118	31	125	20
511	159	105	16	231	592	112	129	28	327	21
59	8	19	4	20	59	8	19	4	38	22
Millions of constant (1972) dollars										
25,771	9,946	11,667	4,244	−125	28,112	10,164	11,519	4,581	−197	23
24,125	9,210	11,278	4,202	−565	24,488	9,488	11,101	4,419	−550	24
2,990	2,990				2,990	2,990				25
1,740	1,740				1,838	1,838				26
1,250	1,250				1,152	1,152				27
14,585	6,064	6,215	2,368	−562	15,019	6,315	6,196	3,101	−592	28
6,085	3,330	2,409	348		6,700	3,448	2,816	409		29
7,830	2,724	3,806	2,522	−562	8,318	2,870	3,380	2,691	−592	30
6,727	2,685	1,521	2,522		7,101	2,890	1,560	2,691		31
1,128	38	1,090	(*)	(*)	1,210	40	1,770	(*)	(*)	32
−562				−562	−592				−592	33
6,581	180	6,063	1,334	18	6,421	180	4,933	1,312	27	34
262	48	128	28	18	297	50	195	29	23	35
1,486	1	100	1,385	(*)	1,587	(*)	101	1,283	3	36
4,693	118	4,770			4,740	139	4,610			37
615	170	264	22	141	648	174	250	62	161	38
339	68	125	18	138	378	63	147	23	142	39
277	126	139	14	8	273	111	103	39	19	40
1,029	356	145	30	299	1,032	339	159	36	298	41
805	481	66	17	71	822	465	68	18	71	42
383	100	66	10	208	357	69	80	16	202	43
42	5	13	3	19	48	5	12	2	24	44
Selected implicit price deflators [4]										
164.8	170.6	168.6	153.1	171.5	185.7	196.3	184.9	169.3	188.6	45
165.4	171.4	165.9	153.0	182.5	187.0	198.2	183.6	169.4	207.0	46
155.3	155.3				183.1	183.1				47
171.2	170.4	172.7	155.8	183.2	196.1	205.5	193.1	175.4	208.3	48
160.2	166.8	158.6	166.6		175.0	171.0	181.0	188.7		49
183.0	207.3	187.8	151.5	183.2	207.0	207.0	205.4	158.4	208.8	50
158.0	170.8	157.5	152.5	161.6	174.5	188.7	178.0	155.0	179.6	51
153.5	164.0	154.1	154.8	150.3	164.5	166.1	164.6	158.2	162.1	52
160.0	162.2	159.9	160.1	158.2	169.4	173.0	167.0	167.7	164.4	53
Addendum: Business capital consumption allowances (Millions) [4]										
4,556					6,438					54
2,007					3,177					55

Real PAC spending in 1980.—According to limited information available in mid-March, real spending for PAC in 1980 was roughly the same as in 1979. Spending for air PAC increased and water PAC decreased. Spending for solid waste collection and disposal probably increased, although little information is currently available. Other and unallocated PAC spending was small and its change insignificant. Business plans as of late 1979 were for an increase in 1980 in new plant and equipment spending for air and a small decrease for water PA. Government spending for construction of public sewer systems decreased by a large amount in 1980 and business spending for installation of septic systems and private connectors to public sewer lines decreased. A continued—though modest—increase of the gross stock of air and water PA capital suggests a further increase in spending on current account to operate such capital.

Revisions in real PAC spending during 1972–78

Each year the PAC spending series is revised to incorporate improvements in coverage and in statistical procedures before being extended an additional year. Revisions this year are moderate in size compared with previous revisions.

Coverage refers to the comprehensive-

Table 3.—Percent Change From Preceding Year in Pollution Abatement and Control Expenditures (Total and Selected Components) in Current and Constant (1972) Dollars, Implicit Price Deflators, and Price Indexes

	1972-75 average annual rate[1]	1973 r	1974 r	1975 r	1976 r	1977 r	1978 r	1979 p
Pollution abatement and control—total:								
Current dollars	15.2	20.0	20.1	18.0	11.0	9.7	13.0	14.1
1972 dollars	5.9	12.7	2.8	8.7	5.4	1.3	5.2	1.3
Implicit price deflator	8.7	6.5	16.8	8.6	5.3	7.3	7.4	12.8
Chain price index	.....	6.6	17.4	8.9	5.0	7.3	7.4	12.0
Fixed-weighted price index	8.9	6.6	17.0	8.9	5.1	7.5	7.5	12.5
Business capital—air:								
Current dollars	12.8	20.7	15.8	20.6	−.3	2.4	5.8	13.1
1972 dollars	4.7	21.1	.4	14.4	−4.0	−3.2	.0	3.5
Implicit price deflator	7.8	4.0	15.3	10.7	4.5	5.9	6.0	9.3
Chain price index	.....	4.7	15.7	11.7	5.2	5.0	6.4	9.3
Fixed-weighted price index	8.3	4.7	15.0	11.5	5.1	5.9	6.1	9.7
Business capital—water:								
Current dollars	11.1	18.9	3.1	12.7	16.7	7.3	8.0	4.6
1972 dollars	2.3	13.3	−8.5	2.3	9.3	.3	−.5	−3.4
Implicit price deflator	8.5	5.0	12.3	10.0	6.8	7.5	8.5	10.9
Chain price index	.....	5.9	12.5	10.0	6.9	7.5	8.4	10.5
Fixed-weighted price index	8.7	5.9	12.5	10.3	7.0	7.0	8.3	10.5
Business current account, private—air:								
Current dollars	22.9	25.4	48.1	22.9	14.9	12.0	10.1	25.7
1972 dollars	8.9	18.0	3.1	13.6	10.9	3.6	0.4	5.4
Implicit price deflator	12.3	11.0	43.0	8.1	3.0	8.1	9.1	19.3
Chain price index	.....	10.7	50.7	8.1	4.2	9.2	8.8	18.5
Fixed-weighted price index	13.3	10.7	47.3	5.0	4.0	10.0	8.9	17.3
Business current account, private—water:								
Current dollars	13.3	20.0	20.7	10.0	20.0	18.2	12.6	10.1
1972 dollars	7.2	13.0	.9	3.4	12.0	8.3	8.2	4.0
Implicit price deflator	10.8	6.3	19.8	16.2	7.9	11.3	6.3	14.8
Chain price index	.....	6.2	19.9	16.1	7.5	11.0	5.0	14.5
Fixed-weighted price index	10.6	6.2	19.8	14.9	7.5	11.0	6.1	14.3

r Revised. p Preliminary.
1. Compounded annually; not calculated for chain because it is defined for adjacent years only.

before being extended an additional year. Revisions this year are moderate in size compared with previous revisions.

Coverage refers to the comprehensiveness of the estimates. This year coverage was expanded to be consistent with that of the Plant and Equipment (P&E) Expenditures Survey, revised by BEA in October 1980.[1] Statistical refers to techniques of direct estimation (as in the taking of surveys), indirect estimation (as in the use of diverse sources of information and assumptions to bridge data gaps), and deflation. Most of the statistical improvements incorporated this year were in current-dollar estimation procedures and were made in order to be consistent with improvements in the P&E Survey. For 1978, the revisions incorporated data not available when the preliminary estimates were made.

Upward revisions were about $0.3 billion (1972 dollars) for 1976 and 1975 and $0.1 billion in 1978 and 1974; the revision was very small in 1977. Downward revisions amounted to about $0.4 billion for 1973 and 1972 (table 5). The effects on year-to-year changes in PAC spending were insignificant except for 1974; PAC spending after revision increased 2.8 percent in 1974 compared with 0.5 percent previously.

Two components of total PAC spending were revised significantly. The first, new plant and equipment for air and water PA, is directly from the P&E Survey. The P&E Survey collects quarterly data on nonfarm business investment and related series five times each year; additional annual data are obtained in the fifth survey. The fifth survey also includes questions on spending for air and water PA and solid waste collection and disposal.

The October revision of series based on the P&E Survey, mentioned earlier, did not include spending for P&E for PA and waste collection and disposal. Revised estimates of PAC spending, discussed in this article, incorporate preliminary revised all-industry totals for spending for P&E for air and water PA; final all-industry totals and industry detail are scheduled to be published in June 1981. In the revised estimates of P&E for PA, the coverage of certain industries was refined and other industries were included for the first time—real estate; professional services; social services and membership organizations;

1. See "Revised Estimates of New Plant and Equipment Expenditures in the United States, 1947–77," in the October 1980 SURVEY OF CURRENT BUSINESS for details.

Table 4.—Federal Grants to State and Local Governments for Pollution

Line		1972 r					1973 r					1974 r				
		Total	Air	Water	Solid waste	Other and unallocated	Total	Air	Water	Solid waste	Other and unallocated	Total	Air	Water	Solid waste	Other and unallocated
		Millions of current dollars														
1	Pollution abatement and control	823	56	821	16	31	1,057	49	975	13	19	2,292	53	2,172	8	10
2	Pollution abatement	758	(*)	755	3	(*)	916	(*)	912	2	(*)	2,112	(*)	2,110	1	(*)
3	Regulation and monitoring	66	39	21	3	2	76	42	30	2	2	61	45	44	2	(*)
4	Research and development	99	17	44	10	28	65	6	33	9	18	39	7	18	5	9
		Millions of constant (1972) dollars														
5	Pollution abatement and control	823	56	821	16	31	983	46	906	12	18	1,996	45	1,886	7	9
6	Pollution abatement	758	(*)	755	3	(*)	851	(*)	848	2	(*)	1,794	(*)	1,793	1	(*)
7	Regulation and monitoring	66	30	21	3	2	71	40	28	2	2	78	39	37	1	(*)
8	Research and development	99	17	44	10	28	61	6	31	8	17	34	6	18	4	6

r Revised. p Preliminary. * Less than $500,000.

and forestry, fisheries, and agricultural services. Thus the revised estimates, like those for total P&E, now cover all nonfarm business. Also, there were several statistical improvements: company reports received too late for use in previously published estimates were incorporated; company reports were reclassified by industry and size of company to reflect diversification, specialization, expansion, or contraction over time; sample data were re-edited to make each industry as representative of the universe as possible; and sample data and revised total new plant and equipment expenditures for the universe were used to re-estimate universe spending for air and water PA.

The second component of total PAC spending revised significantly, solid waste collection and disposal, depends on other sources in addition to the P&E Survey. An indirect estimation procedure is applied. The revised spending estimates are the result of re-application of this procedure using revised estimates of spending for the P&E portion and, for 1978, revised inputs from other sources.

Table 5.—Sources of Revisions of Constant (1972) Dollar Spending for Pollution Abatement and Control, 1972–78

(Millions of constant (1972) dollars)

Year	Previously published	Revisions: Total	Revisions: Coverage	Revisions: Statistical	Revised
	Total pollution abatement and control				
1972	18,669	−302	90	−456	18,220
1973	20,932	−402	115	−517	20,530
1974	21,027	86	130	−44	21,113
1975	22,670	271	29	242	22,941
1976	23,880	387	62	245	24,187
1977	24,451	42	79	−80	24,503
1978	25,652	119	107	12	25,771
	New plant and equipment for air and water pollution abatement [1]				
1972	3,931	−206	48	−314	3,685
1973	4,733	−290	58	−348	4,443
1974	4,303	44	44	0	4,347
1975	4,569	297	25	272	4,866
1976	4,502	304	37	267	4,806
1977	4,317	140	29	111	4,457
1978	4,012	263	25	238	4,275
	Solid waste collection and disposal				
1972	2,454	−96	48	−143	2,358
1973	2,657	−131	57	−188	2,526
1974	2,510	54	85	−32	2,564
1975	3,620	−8	4	−12	3,612
1976	3,795	24	24	0	3,819
1977	4,088	−54	49	−103	4,004
1978	4,270	−97	82	−179	4,173
	All other				
1972	11,197	−1	0	−1	11,196
1973	12,542	19	0	19	12,561
1974	13,214	−13	0	−13	13,203
1975	14,461	−18	0	−18	14,443
1976	15,588	−21	0	−21	15,567
1977	16,056	−14	0	−14	16,042
1978	17,370	−47	0	−47	17,323

1. Spending for this component includes that by electric utility cooperatives; in previous articles spending by these cooperatives was shown separately from new plant and equipment.

Real PA spending during 1972–79

Spending for PA—the direct reduction of emissions of pollutants—accounts for most of PAC spending and will be discussed below using classifications in Federal laws on pollution abatement.[2] The Clean Air Act classifies sources of pollutants as mobile, such as passenger cars, and stationary, such as factories. The Federal Water Pollution Control Act classifies sources as point, such as factories, and nonpoint, that is, sources to which specific emissions are difficult to trace. The Resource Conservation and Recovery Act refers to solid waste management, an activity broader than PA and involving generators, collectors, and disposers of solid wastes. Estimates of spending for solid

2. The Federal laws mentioned stimulated increased spending. However, all PA spending, whether stimulated by other Federal laws or by State and local laws and ordinances, is discussed in this and other sections of this article.

Abatement and Control in Current and Constant (1972) Dollars

1975 r					1976 r					1977 r					1978 r					1979 p					Line
Total	Air	Water	Solid waste	Other and unallocated	Total	Air	Water	Solid waste	Other and unallocated	Total	Air	Water	Solid waste	Other and unallocated	Total	Air	Water	Solid waste	Other and unallocated	Total	Air	Water	Solid waste	Other and unallocated	
Millions of current dollars																									
2,979	56	2,788	11	16	3,466	65	3,288	11	22	4,068	62	3,953	13	40	4,141	72	4,048	19	42	4,188	74	4,096	44	76	1
2,721	1	2,718	3	(*)	3,189	1	3,154	4	(*)	3,512	1	3,506	5	(*)	2,872	1	2,864	7	(*)	4,901	(*)	4,858	7	6	2
102	47	52	3	(*)	151	44	96	3	6	194	56	129	4	7	210	63	125	9	13	219	66	87	23	32	3
47	8	10	6	14	65	8	16	4	17	51	7	18	4	22	59	8	19	4	28	66	8	19	4	38	4
Millions of constant (1972) dollars																									
2,394	44	2,240	9	12	2,548	41	2,459	8	10	2,646	42	2,772	9	21	2,641	49	2,554	12	27	2,958	44	2,850	21	43	5
2,187	(*)	2,184	2	(*)	2,401	1	2,366	3	(*)	2,677	1	2,673	4	(*)	2,489	1	2,483	4	(*)	2,794	(*)	2,757	4	3	6
79	37	42	2	(*)	110	36	69	2	3	132	37	87	3	5	132	40	79	8	5	121	38	61	15	15	7
26	6	15	5	11	35	5	14	3	13	37	5	13	3	17	40	5	13	3	19	43	5	12	2	28	8

waste management and spending for solid waste management for PA are presented in this article for the first time and are contrasted with estimates for collection and disposal by means acceptable to public authorities.

Air.—Spending to reduce emissions of pollutants from mobile sources increased each year during 1972–79 (table 6). This spending, which is almost entirely for passenger cars and trucks, increased at an average annual rate of 12.9 percent, to $5.1 billion in 1979. Most of the absolute increase, $2.9 billion, was to purchase devices to abate emissions from passenger cars and to operate such devices on trucks. Spending to operate devices on cars decreased during 1972–79, reflecting the favorable effects of catalytic devices on fuel economy and of unleaded gasoline (required because of such devices) on engine maintenance costs. Most car manufacturers relied on devices containing chemical catalysts beginning with model year 1975; these devices accounted for over one-third of the absolute increase. Noncatalytic devices were widely used for nitrogen oxides reduction before the introduction of catalytic devices and continued to be used because simple catalytic devices reduce only carbon monoxide and hydrocarbon emissions. Noncatalytic devices accounted for over one-fifth of the absolute increase in spending during 1972–79. The estimates currently available of spending to operate abatement devices on trucks indicate large spending increases each year during 1972–79. These estimates require continued evaluation and improvement; evidence suggesting less spending is accumulating.

Spending to reduce emissions of pollutants from stationary sources increased in 1973, 1975, 1978, and 1979 and decreased in other years during 1972–79. It increased at an average annual rate of 2.6 percent, to $4.4 billion in 1979. Of the absolute increase of $0.7 billion, about three-fourths was in spending to operate industrial PA facilities, especially manufacturing facilities, and occurred after 1974. The remainder was largely by manufacturing establishments to purchase air PA facilities. Purchases of facilities were largely for additions to the gross capital stock rather than for replacement. Accordingly, the gross stock increased (even though spending to purchase facilities decreased more often than they increased) and, except for 1974, increases in spending to operate air PA facilities followed.

Water.—Spending to reduce emissions of pollutants from point sources increased in most years during 1972–79; it decreased in 1977 and 1979 (table 7). During 1972–78, it increased at an average annual rate of 5.9 percent, to $10.7 billion in 1978; spending was $0.2 billion less in 1979, and the average annual increase during 1972–79 was 4.8 percent. Of the absolute increase of $3.0 billion, about two-thirds was in spending to construct public sewer systems and private sewer connectors and spending to operate such systems. The remainder

Table 6.—Constant (1972) Dollar Spending for Abatement of Air Pollutant Emissions From Mobile and Stationary Sources

[Millions of constant (1972) dollars]

	1972	1973	1974	1975	1976	1977	1978	1979 p
Total	5,843	7,079	7,404	8,443	8,972	8,250	9,219	9,486
Mobile sources [1]	3,296	3,859	3,815	4,119	4,079	4,220	5,033	5,127
Devices	701	1,016	1,070	1,863	2,276	2,883	3,715	3,853
Cars	588	843	865	1,578	1,948	2,280	2,352	2,489
Catalytic	0	0	200	917	1,066	1,187	1,204	1,300
Noncatalytic	588	843	665	660	838	1,049	1,148	1,233	1,300
Trucks	118	166	205	276	335	347	364	365
Operation of devices	2,495	1,804	2,245	2,260	2,203	2,337	2,318	2,274
Cars	1,948	1,638	1,886	1,784	1,655	1,475	1,401	1,228
Fuel consumption penalty	992	884	1,072	1,112	1,042	933	825	724
Other [2]	956	774	815	672	620	542	580	504
Trucks	147	205	359	481	635	765	913	1,046
Stationary sources	2,548	4,209	3,588	4,375	4,293	4,130	4,177	4,358
Facilities	2,383	2,882	2,921	3,018	2,761	2,553	2,475	2,554
Industrial	2,307	2,804	2,737	2,940	2,650	2,432	2,356	2,425
Manufacturing	1,046	1,452	1,592	1,686	1,252	1,053	1,148	1,168
Nonmanufacturing	1,261	1,352	1,145	1,304	1,404	1,349	1,212	1,246
Other [3]	65	78	84	78	105	122	118	130
Operation of facilities	1,269	1,327	1,167	1,301	1,533	1,577	1,704	1,804
Industrial	1,177	1,257	1,099	1,273	1,432	1,475	1,648	1,714
Manufacturing	744	741	676	738	853	896	969	1,039
Nonmanufacturing	433	516	423	536	579	561	655	675
Other [4]	79	70	68	87	100	99	87	90

p Preliminary.
1. Excludes spending to reduce emissions from mobile sources other than cars and trucks; such spending was insignificant during 1972–79.
2. Consists of maintenance costs and fuel cost increases due to lead-free gasoline requirement.
3. Consists of spending for fixed capital of government enterprises such as the Tennessee Valley Authority.
4. Consists of spending to operate government enterprises and all spending by government; separate data on spending to purchase and spending to operate government pollution abatement facilities are not available.

Table 7.—Constant (1972) Dollar Spending for Abatement of Water Pollutant Emissions From Point Sources

[Millions of constant (1972) dollars]

	1972	1973	1974	1975	1976	1977	1978	1979 p
Total	7,563	8,344	8,614	9,359	9,994	9,892	10,658	10,510
Facilities	5,380	5,880	6,107	6,717	7,137	6,847	7,414	7,094
Industrial	1,358	1,038	1,610	1,946	2,151	2,028	1,919	1,760
Manufacturing	804	840	864	1,001	1,177	1,168	805	717
Nonmanufacturing	554	790	757	945	974	857	1,115	1,044
Public sewer systems, private connectors to them, and other	4,022	4,261	4,497	4,770	4,980	4,821	5,495	5,334
Public sewer systems and private connectors	3,989	4,204	4,432	4,721	4,933	4,769	5,434	5,279
Other [1]	33	57	56	49	54	53	61	55
Operation of facilities	2,184	2,465	2,507	2,643	2,858	3,046	3,273	3,422
Industrial	608	933	936	909	1,100	1,185	1,297	1,366
Manufacturing	373	655	648	671	700	817	891	927
Nonmanufacturing	237	278	288	238	340	369	407	439
Public sewer systems, private connectors to them, and other	1,375	1,523	1,572	1,673	1,759	1,861	1,976	2,055
Public sewer systems and private connectors	1,124	1,297	1,204	1,304	1,413	1,543	1,676	1,755
Other [2]	251	226	306	369	320	319	300	312

p Preliminary.
1. Consists of spending by owner's of animal feedlots and spending for fixed capital of government enterprises such as the Tennessee Valley Authority.
2. Consists of spending by owner's of animal feedlots, spending to operate government enterprises, and all spending by government; separate data on spending to purchase and spending to operate government pollution abatement facilities are not available.

Table 8.—Constant (1972) Dollar Spending by Business and Government for Solid Waste Collection and Disposal and Related Series

Line		1972	1973	1974	1975	1976	1977	1978	1979 p
		Millions of constant (1972) dollars							
1	Solid waste collection and disposal by means acceptable to Federal, State, and local authorities	3,359	3,526	3,564	3,612	3,810	4,004	4,173	4,364
2	Solid waste management	4,002	4,623	4,899	4,977	5,230	5,437	5,607	5,941
3	Pollution abatement	873	1,021	1,109	1,280	1,444	1,626	1,654	2,159
4	Other [1]	3,720	3,802	3,720	3,690	3,786	3,811	3,603	3,793
		Percent change from preceding year							
5	Solid waste collection and disposal by means acceptable to Federal, State, and local authorities		5.0	1.1	1.3	5.7	4.8	4.2	5.1
6	Solid waste management		4.8	1.4	1.5	5.1	4.0	4.2	4.8
7	Pollution abatement		17.0	14.5	9.5	12.8	12.6	14.5	15.8
8	Other [1]		2.0	−2.2	−.6	2.4	.7	−.2	−.5

p Preliminary.
1. Includes spending for the avoidance of the slowing of production or consumption activity due to the accumulation of solid waste and for other purposes except pollution abatement.

was largely by nonmanufacturing establishments to purchase and operate water PA facilities.

The decreases in 1977 and 1979 in point-source spending for water PA reflect decreases for facilities. Spending by industry to purchase water PA facilities decreased in both years and also in 1974 and 1978. Spending to construct public sewer systems and other facilities decreased in 1977 and 1979 only. Even though there were decreases, spending for water PA facilities was largely for addition to the gross capital stock rather than replacement, and this resulted in increases in spending to operate such facilities each year during 1972–79.

Spending to reduce emissions of pollutants from nonpoint sources decreased at an average annual rate of 2.0 percent during 1972–79, to $0.6 billion in 1979. Estimates of such spending are of limited reliability because spending data specific to nonpoint sources are fragmentary.

Solid waste and other.—Spending for solid waste collection and disposal by means acceptable to Federal, State and local authorities increased each year during 1972–79 (table 8, line 1). It increased at an average annual rate of 3.9 percent, to $4.4 billion in 1979. Levels of spending for solid waste management (line 2) and the portion for PA (line 3) differ markedly each year from corresponding levels of spending for solid waste collection and disposal by acceptable means. Year-to-year changes are similar for the first two series; the changes are markedly different in the third series. The differences in levels for any given year and in year-to-year changes largely reflect differences in definition.

Solid waste collection and disposal by acceptable means is defined with respect to two aspects: collection and disposal is the gathering of solid waste to facilitate processing, materials separation, storage, transportation, treatment, and ultimate disposal; acceptability is determined with respect to laws, administrative requirements, and court decisions as implemented by Federal, State, and local authorities. *Solid waste management* is the administration and performance of activities to reduce the generation of solid waste, to recycle by-products otherwise resulting in solid waste, and to collect and dispose of solid waste. Most solid waste management activities serve several purposes. The purposes may be classified generally as avoidance of the slowing of production and consumption activity due to accumulation of solid waste, protection of public health (including pollution abatement, accident control, and disease control), conservation of resources, and all other. The last category consists of avoidance of adverse effects on land values, public nuisances, scenic blights, and other interferences with community life and development. *Solid waste management for pollution abatement* is defined with respect to two aspects: solid waste management is defined above; pollution abatement is the reduction or elimination of emissions of pollutants that is brought about by human activity directed to this purpose.[3]

The "acceptable means" series has been used in the past by some analysts to estimate a "management" series and by some to estimate an "abatement" series; others have simply used the "acceptable means" series without modification. This series is difficult to define and measure; the criteria for acceptability vary over time and between localities. The availability of the two new series diminishes the need for the "acceptable means" series. The "management" series is the least difficult to measure and is useful in studies of spending for total residuals (gaseous, liquid, solid) management. The "abatement" series is most difficult to measure directly although indirect methods have been developed; it is most useful in studies of spending for pollution abatement and is consistent with estimates of air and water PA in table 1. The substitution of the "abatement" series for the "acceptable means" series in the total series on PAC is currently under review; such substitution was not possible earlier.

3. See "Conceptual and Statistical Issues in Developing Environmental Measures—Recent U.S. Experience," by John E. Cremeans, *Review of Income and Wealth*, June, 1977 for further discussion of the concept of pollution abatement.