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Project Summary Utility FGD Survey October 1983 - September 1984

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Project Summary
Utility FGD Survey
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Prepared by

M. T. Melia, R. S. McKibben,
and B. W. Pelsor

PEDCo Environmental, Inc.
11499 Chester Road
Cincinnati, Ohio 45246

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EPA Project Manager: John Busik
EPA Work Assignment Manager: Sonya M. Stelmack

U.S. ENVIRONMENTAL PROTECTION AGENCY
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ABSTRACT

The Utility FGD Survey Summary report, which is generated by a computerized data base system, represents a survey of operational and planned domestic utility flue gas desulfurization (FGD) systems. It summarizes information contributed by the utility industry, system and equipment suppliers, system designers, research organizations, and regulatory agencies. The data cover system design, fuel characteristics, history of utility FGD operating status nationwide, and capital and annual costs for operating FGD systems. The development status (operational, under construction, or in the planning stages), system supplier, and process, are tabulated alphabetically by utility company. Also included are highlights of FGD system developments during the period of October 1983 through September 1984.

Current data for domestic FGD systems show 124 systems in operation, 25 systems under construction, and 68 systems planned. The current FGD-controlled capacity in the United States is 47,255 MW.

INTRODUCTION

This FGD survey report was prepared by PEDCo Environmental, Inc., under the direction of the Stationary Source Control Division (SSCD) of EPA, Washington, D.C. Preceding issues of the summary report through December 1981 are available through the National Technical Information Service (NTIS). Succeeding issues may be purchased from the Research Reports Center of the Electric Power Research Institute (EPRI). The information in this report is generated by a computerized data base system known as the Flue Gas Desulfurization Information System (FGDIS). The structure diagram of the FGDIS in Figure 1 shows the informational areas the system addresses and some representative data items contained in each. The design information contained in the FGDIS encompasses the entire emission control system and the power generating unit to which it is applied. Performance data for operational FGD systems include monthly dependability parameters, service time, and descriptions of operational problems and solutions.

Aside from its use in generating the survey report, the FGDIS is available for remote terminal access. The data base represents a more immediate method for users to examine the data acquired under the survey program. Access to the FGDIS also enables users to obtain additional data that are too specific for inclusion in the quarterly report. Direct access to the data base allows analyses of the data (e.g., averages, maxima, minima, and standard deviations of various parameters), the use of simple mathematical functions, capability for virtually unlimited data cross-referencing, and data tabulation to fit the individual informational needs. An FGDIS User's Manual is available from NTIS (NTIS No. PB 83146209). Requests for further information concerning the FGDIS should be directed to Michael Melia or Bayard Pelsor, PEDCo Environmental, Inc. (513/782-4700). Information concerning access to the FGDIS can be obtained from Walter Finch, NTIS, 5285 Port Royal Road, Springfield, Virginia 22161 (703/487-4808).

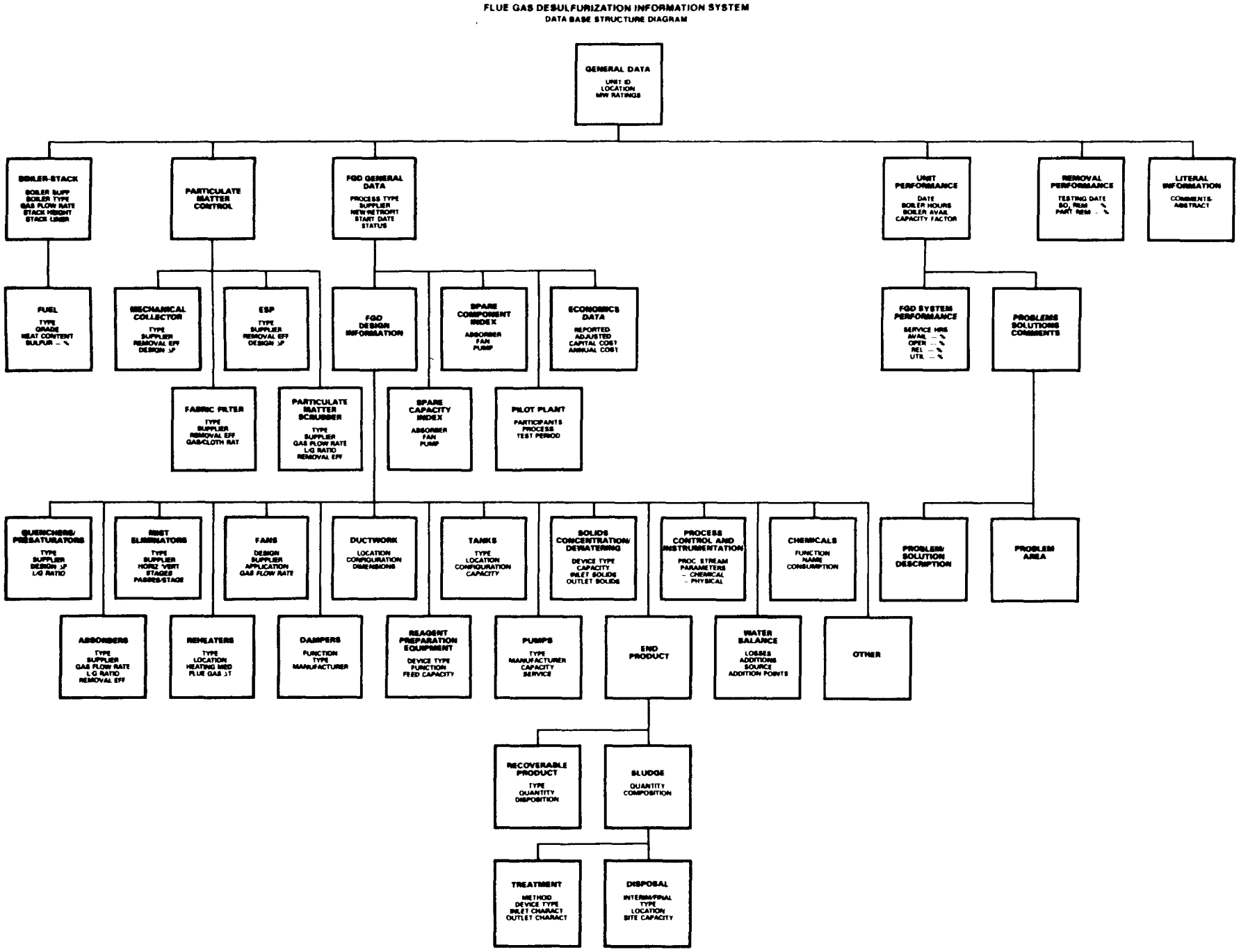

Figure 1. Computerized data base structure diagram.

PROJECT SUMMARY

Table 1 summarizes the status of flue gas desulfurization (FGD) systems in the United States as of the end of September 1984. Table 2 lists the units on which the status has changed during the October 1983-September 1984 period. The units included in the figures presented in Table 1 are identified in Table 3.

TABLE 1. NUMBER AND TOTAL CAPACITY OF FGD SYSTEMS

Status	No. of units	Total controlled capacity,[a] MW	Equivalent scrubbed capacity,[b] MW
Operational	124	50,870	47,255
Under construction	25	14,656	14,335
Planned:			
Contract awarded	15	9,248	9,190
Letter of intent	3	2,500	2,500
Requesting/evaluating bids	4	1,926	1,926
Considering only FGD systems for SO_2 control	46	27,512	26,869
TOTAL	217	106,712	102,075

[a]Summation of the gross unit capacities (MW) brought into compliance by the use of FGD systems, regardless of the percentage of the flue gas scrubbed by the FGD system(s).

[b]Summation of the effective scrubbed flue gas capacities in equivalent MW, based on the percentage of flue gas scrubbed by the FGD system(s).

Figure 2 presents a historic breakdown of utility status reports for operational, under-construction, and planned FGD capacity. The operating FGD capacity has grown significantly each year since 1972. Since 1977 the capacity under construction has been fairly stable. The planned capacity reported by the utilities has increased each year in the past until 1980, when it reached its peak, and has dropped sharply since that time.

TABLE 2. SUMMARY OF FGD SYSTEM STATUS CHANGES, OCTOBER 1983-SEPTEMBER 1984

FGD status report September 30, 1983	Operational		Under construction		Contract awarded		Letter of intent		Requesting/ eval. bids		Considering FGD		Total	
	No. 116	MW[a] 43,206[b]	No. 26	MW[a] 14,609[b]	No. 21	MW[a] 12,635	No. 7	MW[a] 6,060	No. 3	MW[a] 1,840[b]	No. 41	MW[a] 23,549[b]	No. 214	MW[a] 101,899[b]
Arizona Public Service														
Cholla 5											+1	126	+1	126
Big Rivers Electric														
D.B. Wilson 1	+1	440	-1	440										
Boston Edison														
New Boston 1									+1	388			+1	388
New Boston 2									+1	388			+1	388
Central Illinois Light														
Duck Creek 2											-1	450	-1	450
Cincinnati Gas & Electric														
Zimmer 1											+1	1,386	+1	1,386
Colorado Ute Electric														
Craig 3	+1	447	-1	447										
Deseret Generating & Transmission														
Bonanza 1	+1	410	-1	410										
General Public Utilities														
Coal 1									-1	690	+1	690		
Jersey Central Power & Light														
N/D 1											-1	625	-1	625
Los Angeles Dept. of Water & Power														
Intermountain 2			+1	820	-1	820								
Lower Colorado River Authority														
Fayette Power Project 3			+1	451	-1	451								
Fayette Power Project 4											+1	451	+1	451
Middle South Utilities														
Arkansas Lignite 5							-1	890					-1	890
Arkansas Lignite 6							-1	890					-1	890
Unassigned 1							-1	890					-1	890
Unassigned 2							-1	890					-1	890
Montana Power														
Colstrip 3	+1	778	-1	778										

TABLE 2 (continued)

FGD status report September 30, 1983	Operational		Under construction		Contract awarded		Letter of intent		Requesting/ eval. bids		Considering FGD		Total	
	No. 116	MW[a] 43,206[b]	No. 26	MW[a] 14,609[b]	No. 21	MW[a] 12,635	No. 7	MW[a] 6,060	No. 3	MW[a] 1,840[b]	No. 41	MW[a] 23,543[b]	No. 214	MW[a] 101,899[b]
New York State Electricity & Gas														
Somerset	+1	625	-1	625										
Orlando Utilities Commission														
C. H. Stanton 1			+1	465	-1	465								
Pacific Power & Light														
Jim Bridger 2			+1	550	-1	550								
Wyodak 1					+1	330					-1	330		
Platte River Power Authority														
Rawhide 1	+1	279	-1	279										
Public Service Company of Colorado														
Pawnee 2											+1	500	+1	500
San Antonio Public Service														
N/D 3											+1	500	+1	500
N/D 4											+1	500	+1	500
Seminole Electric														
Seminole 2	+1	620	-1	620										
South Carolina Public Service														
Cross 2	+1	450	-1	450										
Southern Indiana Gas & Electric														
A.B. Brown 2			+1	265	-1	265								
Southwestern Electric Power														
Dolet Hills 1			+1	720	-1	720								
Southwestern Public Service														
South Plains 1											+1	572	+1	572
West Texas Utilities														
Oklaunion 1			+1	504	-1	504								
Total	124	47,255	25	14,335	15	9,190	3	2,500	4	1,926	46	26,869	217	102,075

[a] Equivalent scrubbed capacity.

[b] This value was modified slightly to reflect a MW correction.

TABLE 3. SUMMARY OF OPERATIONAL AND PLANNED DOMESTIC FGD SYSTEMS

Company name/unit name	City	State	Capacity, MW (gross)	Fuel % sulfur	FGD process	FGD status[a]	System supplier
Alabama Electric							
Tombigbee 2	Leroy	Alabama	255	1.61	Limestone	1	Peabody Process Systems
Tombigbee 3	Leroy	Alabama	255	1.61	Limestone	1	Peabody Process Systems
Arizona Electric Power							
Apache 2	Cochise	Arizona	195	0.70	Limestone	1	Research-Cottrell
Apache 3	Cochise	Arizona	195	0.70	Limestone	1	Research-Cottrell
Arizona Public Service							
Cholla 1	Joseph City	Arizona	119	0.50	Limestone	1	Research-Cottrell
Cholla 2	Joseph City	Arizona	285	0.50	Limestone	1	Research-Cottrell
Cholla 4	Joseph City	Arizona	375	0.50	Limestone	1	Research-Cottrell
Cholla 5	Joseph City	Arizona	375	0.50	Process not selected	6	Vendor not selected
Four Corners 1	Fruitland	New Mexico	195	0.75	Lime/alkaline flyash	1	GE Environmental Services
Four Corners 2	Fruitland	New Mexico	195	0.75	Lime/alkaline flyash	1	GE Environmental Services
Four Corners 3	Fruitland	New Mexico	225	0.75	Lime/alkaline flyash	1	GE Environmental Services
Four Corners 4	Farmington	New Mexico	745	0.75	Lime	2	Babcock and Wilcox
Four Corners 5	Farmington	New Mexico	745	0.75	Lime	2	Babcock and Wilcox
Associated Electric							
Thomas Hill 3	Moberly	Missouri	730	4.80	Limestone	1	M. W. Kellogg
Atlantic City Electric							
Cumberland 1	Millville	New Jersey	330	3.25	Limestone	6	Vendor not selected
Basin Electric Power							
Antelope Valley 1	Beulah	North Dakota	440	0.68	Lime/spray drying	1	Joy Mfg/Niro Atomizer
Antelope Valley 2	Beulah	North Dakota	440	0.68	Lime/spray drying	2	Joy Mfg/Niro Atomizer
Antelope Valley 3	Beulah	North Dakota	560	0.68	Lime/spray drying	6	Vendor not selected
Laramie River 1	Wheatland	Wyoming	570	0.54	Limestone	1	Research-Cottrell
Laramie River 2	Wheatland	Wyoming	570	0.54	Limestone	1	Research-Cottrell
Laramie River 3	Wheatland	Wyoming	570	0.54	Lime/spray drying	1	Babcock and Wilcox
Big Rivers Electric							
D. B. Wilson 1	Centertown	Kentucky	440	3.75	Lime	1	M. W. Kellogg
Green 1	Sebree	Kentucky	242	3.91	Lime	1	American Air Filter
Green 2	Sebree	Kentucky	242	3.91	Lime	1	American Air Filter
Boston Edison							
New Boston 1	Boston	Massachusetts	388	2.30	Limestone	5	Vendor not selected
New Boston 2	Boston	Massachusetts	388	2.30	Limestone	5	Vendor not selected
Cajun Electric Power							
Oxbow 1	DeSoto Parish	Louisiana	540	0.60	Lime/spray drying	3	Joy Mfg/Niro Atomizer
Central Illinois Light							
Duck Creek 1	Canton	Illinois	416	3.40	Limestone	1	Environeering, Riley Stoker

TABLE 3. (continued)

Company name/unit name	City	State	Capacity, MW (gross)	Fuel % sulfur	FGD process	FGD status[a]	System supplier
Central Illinois Public Service							
Newton 1	Newton	Illinois	617	3.00	Dual alkali	1	GE Environmental Services
Central Main Power							
Sears Island 1	Penobscot Bay	Maine	600	2.23	Process not selected	6	Vendor not selected
Central Power & Light							
Coleto Creek 2	Fannin	Texas	720	0.39	Lime/spray drying	3	Joy Mfg/Niro Atomizer
Cincinnati Gas & Electric							
East Bend 1	Rabbit Hash	Kentucky	650	4.00	Process not selected	6	Vendor not selected
East Bend 2	Rabbit Hash	Kentucky	650	2.60	Lime	1	Babcock and Wilcox
Zimmer 1	Moscow	Ohio	1386	3.50	Process not selected	6	Vendor not selected
Colorado Ute Electric							
Craig 1	Craig	Colorado	455	0.45	Limestone	1	Peabody Process Systems
Craig 2	Craig	Colorado	455	0.45	Limestone	1	Peabody Process Systems
Craig 3	Craig	Colorado	447	0.45	Lime/spray drying	1	Babcock and Wilcox
Columbus & Southern Ohio Electric							
Conesville 5	Conesville	Ohio	405	4.50	Lime	1	Air Correction Division, UOP
Conesville 6	Conesville	Ohio	405	4.50	Lime	1	Air Correction Division, UOP
Cooperative Power							
M/D 1	Undecided	Ohio	750		Limestone	6	Vendor not selected
Cooperative Power Association							
Coal Creek 1	Underwood	North Dakota	550	0.63	Lime/alkaline flyash	1	Combustion Engineering
Coal Creek 2	Underwood	North Dakota	550	0.63	Lime/alkaline flyash	1	Combustion Engineering
Delmarva Power & Light							
Delaware City 1	Delaware City	Delaware	60	7.00	Wellman Lord	1	Davy McKee
Delaware City 2	Delaware City	Delaware	60	7.00	Wellman Lord	1	Davy McKee
Delaware City 3	Delaware City	Delaware	60	7.00	Wellman Lord	1	Davy McKee
Vienna 9	Vienna	Maryland	550	2.50	Process not selected	6	Vendor not selected
Deseret Gen. and Trans.							
Bonanza 1	Vernal	Utah	410	0.50	Limestone	1	Combustion Engineering
Bonanza 2	Vernal	Utah	410	0.50	Limestone	6	Vendor not selected
Duquesne Light							
Elrama 1-4	Elrama	Pennsylvania	510	2.05	Lime	1	GE Environmental Services
Phillips 1-6	South Heights	Pennsylvania	408	2.05	Lime	1	GE Environmental Services
East Kentucky Power							
J. K. Smith 1	Winchester	Kentucky	650	1.50	Lime	3	Babcock and Wilcox
Spurlock 2	Maysville	Kentucky	500	3.50	Lime	1	Thyssen/CEA

TABLE 3. (continued)

Company name/unit name	City	State	Capacity, MW (gross)	Fuel % sulfur	FGD process	FGD status[a]	System supplier
Florida Power & Light							
Martin 3	Martin County	Florida	800		Process not selected	6	Vendor not selected
Martin 4	Martin County	Florida	800		Process not selected	6	Vendor not selected
General Public Utilities							
Coal 1	Forked River	New Jersey	690	2.00	Limestone	6	Vendor not selected
Coal 2	Undecided	Undecided	690	3.50	Limestone	6	Vendor not selected
Grand Haven Board of Light & Power							
J. B. Sims 3	Grand Haven	Michigan	65	2.75	Lime	1	Babcock and Wilcox
Grand River Dam Authority							
GRDA 2	Pryor	Oklahoma	575	0.95	Lime/spray drying	2	Flakt
Hoosier Energy							
Merom 1	Merom	Indiana	490	3.50	Limestone	1	Mitsubishi Heavy Industries
Merom 2	Merom	Indiana	490	3.50	Limestone	1	Mitsubishi Heavy Industries
Houston Lighting & Power							
Limestone 1	Jewitt	Texas	750	1.08	Limestone	2	Combustion Engineering
Limestone 2	Jewitt	Texas	750	1.08	Limestone	2	Combustion Engineering
Malakoff 1	Malakoff	Texas	690	1.10	Limestone	3	GE Environmental Services
Malakoff 2	Malakoff	Texas	690	1.10	Limestone	3	GE Environmental Services
W. A. Parish 8	Thompsons	Texas	600	0.41	Limestone	1	GE Environmental Services
Indianapolis Power & Light							
Patriot 1	Patriot	Indiana	650	3.50	Limestone	6	Vendor not selected
Partiot 2	Patriot	Indiana	650	3.50	Limestone	6	Vendor not selected
Patriot 3	Patriot	Indiana	650	3.50	Limestone	6	Vendor not selected
Petersburg 3	Petersburg	Indiana	532	3.25	Limestone	1	Air Correction Division, UOP
Petersburg 4	Petersburg	Indiana	530	3.50	Limestone	2	Research-Cottrell
Iowa Electric Light & Power							
Guthrie Co. 1	Panora	Iowa	720	0.40	Limestone	4	Combustion Engineering
Jacksonville Electric Authority							
St. Johns River Power 1	Jacksonville	Florida	612	2.50	Limestone	2	Research-Cottrell
St. Johns River Power 2	Jacksonville	Florida	612	2.50	Limestone	2	Research-Cottrell
Kansas City Power & Light							
La Cygne 1	LaCygne	Kansas	874	5.39	Limestone	1	Babcock and Wilcox

TABLE 3. (continued)

Company name/unit name	City	State	Capacity, MW (gross)	Fuel % sulfur	FGD process	FGD status[a]	System supplier
Kansas Power & Light							
Jeffrey 1	Wamego	Kansas	720	0.32	Limestone	1	Combustion Engineering
Jeffrey 2	Wamego	Kansas	720	0.32	Limestone	1	Combustion Engineering
Jeffrey 3	Wamego	Kansas	730	0.32	Limestone	1	Combustion Engineering
Lawrence 4	Lawrence	Kansas	125	0.55	Limestone	1	Combustion Engineering
Lawrence 5	Lawrence	Kansas	420	0.55	Limestone	1	Combustion Engineering
Kentucky Utilities							
Green River 1-3	Central City	Kentucky	65	2.23	Lime	1	American Air Filter
Hancock 1	Hawesville	Kentucky	708	3.50	Limestone	3	Babcock and Wilcox
Hancock 2	Hawesville	Kentucky	708	3.50	Limestone	6	Vendor not selected
Lakeland Utilities							
McIntosh 3	Lakeland	Florida	364	2.56	Limestone	1	Babcock and Wilcox
Los Angeles Dept. of Water and Power							
Intermountain 1	Delta	Utah	820	0.79	Limestone	2	GE Environmental Services
Intermountain 2	Delta	Utah	820	0.79	Limestone	2	GE Environmental Services
Louisville Gas & Electric							
Cane Run 4	Louisville	Kentucky	188	3.87	Lime	1	American Air Filter
Cane Run 5	Louisville	Kentucky	200	3.80	Lime	1	Combustion Engineering
Cane Run 6	Louisville	Kentucky	299	4.80	Dual Alkali	1	Thyssen/CEA
Mill Creek 1	Louisville	Kentucky	358	3.75	Lime	1	Combustion Engineering
Mill Creek 2	Louisville	Kentucky	350	3.75	Lime	1	Combustion Engineering
Mill Creek 3	Louisville	Kentucky	427	3.87	Lime	1	American Air Filter
Mill Creek 4	Louisville	Kentucky	495	3.75	Lime	1	American Air Filter
Paddy's Run 6	Louisville	Kentucky	72	3.70	Lime	1	Combustion Engineering
Trimble County 1	Bedford	Kentucky	575	4.00	Process not selected	5	Vendor not selected
Trimble County 2	Bedford	Kentucky	575	4.00	Process not selected	5	Vendor not selected
Lower Colorado River Authority							
Fayette Power Project 3	La Grange	Texas	451	1.70	Limestone	2	Combustion Engineering
Fayette Power Project 4	La Grange	Texas	451	1.70	Limestone	6	Vendor not selected
Marquette Board of Light & Power							
Shiras 3	Marquette	Michigan	44	0.30	Lime/spray drying	1	GE Environmental Services
Michigan So. Central Power Agency							
Project 1	Litchfield	Michigan	55	2.25	Limestone	1	Babcock & Wilcox
Middle South Utilities							
Wilton 1	Convent	Louisiana	890	0.50	Limestone	4	Combustion Engineering
Wilton 2	Convent	Louisiana	890	0.50	Limestone	4	Combustion Engineering

TABLE 3. (continued)

Company name/unit name	City	State	Capacity, MW (gross)	Fuel % sulfur	FGD process	FGD status[a]	System supplier
Minnesota Power & Light							
Clay Boswell 4	Cohasset	Minnesota	554	0.94	Lime/alkaline flyash	1	Peabody Process Systems
Minnkota Power							
Milton R. Young 2	Center	North Dakota	440	0.60	Lime/alkaline flyash	1	Thyssen/CEA
Monongahela Power							
Pleasants 1	Willow Island	West Virginia	626	3.00	Lime	1	Babcock and Wilcox
Pleasants 2	Willow Island	West Virginia	626	3.00	Lime	1	Babcock and Wilcox
Montana Power							
Colstrip 1	Colstrip	Montana	360	0.78	Lime/alkaline flyash	1	Thyssen/CEA
Colstrip 2	Colstrip	Montana	360	0.78	Lime/alkaline flyash	1	Thyssen/CEA
Colstrip 3	Colstrip	Montana	778	0.70	Lime/alkaline flyash	1	Bechtel/Montana Power
Colstrip 4	Colstrip	Montana	778	0.70	Lime/alkaline flyash	2	Bechtel/Montana Power
Montana-Dakota Utilities							
Coyote 1	Beulah	North Dakota	440	0.87	Sodium carbonate/spray drying	1	Wheelabrator-Frye/R.I.
Muscatine Power & Water							
Muscatine 9	Muscatine	Iowa	166	3.21	Limestone	1	Research-Cottrell
Nebraska Public Power District							
Fossil III 1	Sargent	Nebraska	650	0.36	Process not selected	6	Vendor not selected
Nevada Power							
Harry Allen 1	Las Vegas	Nevada	500		Process not selected	6	Vendor not selected
Harry Allen 2	Las Vegas	Nevada	500		Process not selected	6	Vendor not selected
Harry Allen 3	Las Vegas	Nevada	500		Process not selected	6	Vendor not selected
Harry Allen 4	Las Vegas	Nevada	500		Process not selected	6	Vendor not selected
Reid Gardner 1	Moapa	Nevada	125	0.50	Sodium carbonate	1	Thyssen/CEA
Reid Gardner 2	Moapa	Nevada	125	0.50	Sodium carbonate	1	Thyssen/CEA
Reid Gardner 3	Moapa	Nevada	125	0.50	Sodium carbonate	1	Thyssen/CEA
Reid Gardner 4	Moapa	Nevada	295	0.75	Sodium carbonate	1	Thyssen/CEA
New York State Electric & Gas							
Somerset 1	Somerset	New York	625	2.70	Limestone	1	Peabody Process Systems
Niagara Mohawk Power							
Charles R. Huntley 66	Buffalo	New York	100	1.80	Aqueous carbonate/spray drying	1	Rockwell International
Northern Indiana Public Service							
Schafer 17	Wheatfield	Indiana	391	3.20	Dual Alkali	1	FMC
Schafer 18	Wheatfield	Indiana	391	3.20	Dual Alkali	2	FMC

TABLE 3. (continued)

Company name/unit name	City	State	Capacity, MW (gross)	Fuel % sulfur	FGD process	FGD status[a]	System supplier
Northern States Power							
Riverside 6-7	Minneapolis	Minnesota	110	1.20	Lime/spray drying	1	Joy Mfg/Niro Atomizer
Sherburne 1	Becker	Minnesota	750	0.80	Limestone/alkaline flyash	1	Combustion Engineering
Sherburne 2	Becker	Minnesota	750	0.80	Limestone/alkaline flyash	1	Combustion Engineering
Sherburne 3	Becker	Minnesota	860	1.00	Lime/spray drying	2	Joy Mfg/Niro Atomizer
Orlando Utilities Commission							
C. H. Stanton 1	Orlando	Florida	465		Limestone	2	Combustion Engineering
Pacific Power & Light							
Jim Bridger 1	Rock Springs	Wyoming	550	0.56	Sodium carbonate	3	Babcock & Wilcox
Jim Bridger 2	Rock Springs	Wyoming	550	0.56	Sodium carbonate	2	Babcock & Wilcox
Jim Bridger 3	Rock Springs	Wyoming	550	0.56	Sodium carbonate	3	Babcock & Wilcox
Jim Bridger 4	Rock Springs	Wyoming	550	0.56	Sodium carbonate	1	Air Correction Division, UOP
Wyodak 1	Joliet	Wyoming	330		Lime/spray drying	3	Joy Mfg/Niro Atomizer
Pennsylvania Power							
Bruce Mansfield 1	Shippingport	Pennsylvania	917	3.50	Lime	1	GE Environmental Services
Bruce Mansfield 2	Shippingport	Pennsylvania	917	3.50	Lime	1	GE Environmental Services
Bruce Mansfield 3	Shippingport	Pennsylvania	917	4.30	Lime	1	M. W. Kellogg
Philadelphia Electric							
Cromby 1	Phoenixville	Pennsylvania	160	2.00	Magnesium oxide	1	United Engineers
Eddystone 1	Eddystone	Pennsylvania	240	2.00	Magnesium oxide	1	United Engineers
Eddystone 2	Eddystone	Pennsylvania	334	2.00	Magnesium oxide	1	United Engineers
Plains Electric G & T							
Plains Escalante 1	Prewitt	New Mexico	233	0.80	Limestone	2	Combustion Engineering
Platte River Power Authority							
Rawhide 1	Wellington	Colorado	279	0.34	Lime/spray drying	1	Joy Mfg/Niro Atomizer
Public Service Indiana							
Gibson 5	Princeton	Indiana	670	3.30	Limestone	1	M. W. Kellogg
Public Service of New Mexico							
New Mexico 1	Bisti	New Mexico	500		Process not selected	6	Vendor not selected
San Juan 1	Waterflow	New Mexico	361	0.80	Wellman Lord	1	Davy McKee
San Juan 2	Waterflow	New Mexico	350	0.80	Wellman Lord	1	Davy McKee
San Juan 3	Waterflow	New Mexico	534	0.80	Wellman Lord	1	Davy McKee
San Juan 4	Waterflow	New Mexico	534	0.80	Wellman Lord	1	Davy McKee
Public Service of Colorado							
Pawnee 2	Rush	Colorado	500	0.35	Trona/dry injection	6	Vendor not selected

TABLE 3. (continued)

Company name/unit name	City	State	Capacity, MW (gross)	Fuel % sulfur	FGD process	FGD status[a]	System supplier
Salt River Project							
Coronado 1	St. Johns	Arizona	400	0.55	Limestone	1	M. W. Kellogg
Coronado 2	St. Johns	Arizona	400	0.55	Limestone	1	M. W. Kellogg
Coronado 3	St. Johns	Arizona	400	0.60	Limestone	6	Vendor not selected
San Antonio Public Service							
N/D 1	Undecided	Texas	500	1.50	Limestone	6	Vendor not selected
N/D 2	Undecided	Texas	500	1.50	Limestone	6	Vendor not selected
N/D 3	Undecided	Texas	500	1.50	Limestone	6	Vendor not selected
N/D 4	Undecided	Texas	500	1.50	Limestone	6	Vendor not selected
San Miguel Electric							
San Miguel 1	San Miguel	Texas	400	2.39	Limestone	1	Babcock & Wilcox
Seminole Electric							
Seminole 1	Palatka	Florida	620	2.75	Limestone	1	Peabody Process Systems
Seminole 2	Palatka	Florida	620	2.75	Limestone	1	Peabody Process Systems
Taylor 1	Perry	Florida	620		Process not selected	6	Vendor not selected
Taylor 2	Perry	Florida	620		Process not selected	6	Vendor not selected
Sierra Pacific Power							
Thousand Springs 1	Wells	Nevada	500		Process not selected	6	Vendor not selected
Thousand Springs 2	Wells	Nevada	500		Process not selected	6	Vendor not selected
Thousand Springs 3	Wells	Nevada	500		Process not selected	6	Vendor not selected
Valmy 2	Valmy	Nevada	276	0.50	Lime/spray drying	2	Rockwell International
Sikestone Board of Municipal Utilities							
Sikestone 1	Sikestone	Missouri	235	2.80	Limestone	1	Babcock and Wilcox
South Carolina Public Service							
Cross 1	Cross	South Carolina	450	1.80	Limestone	3	Peabody Process Systems
Cross 2	Cross	South Carolina	450	1.80	Limestone	1	Peabody Process Systems
Winyah 2	Georgetown	South Carolina	280	1.00	Limestone	1	Babcock & Wilcox
Winyah 3	Georgetown	South Carolina	280	1.00	Limestone	1	Babcock & Wilcox
Winyah 4	Georgetown	South Carolina	280	1.70	Limestone	1	American Air Filter
South Mississippi Electric Power							
R. D. Morrow, Sr., 1	Purvis	Mississippi	200	1.64	Limestone	1	Environeering, Riley Stoker
R. D. Morrow, Sr., 2	Purvis	Mississippi	200	1.64	Limestone	1	Environeering, Riley Stoker
Southern Illinois Power							
Marion 4	Marion	Illinois	184	3.75	Limestone	1	Babcock and Wilcox
Southern Indiana Gas and Electric							
A. B. Brown 1	West Franklin	Indiana	265	3.35	Dual alkali	1	FMC
A. B. Brown 2	West Franklin	Indiana	265	3.35	Dual alkali	2	FMC

TABLE 3. (continued)

Company name/unit name	City	State	Capacity, MW (gross)	Fuel % sulfur	FGD process	FGD status[a]	System supplier
Southwestern Electric Power							
Dolet Hills 1	Mansfield	Louisiana	720	0.70	Limestone	2	Air Correction Division, UOP
Henry W. Pirkey 1	Hallsville	Texas	720	0.80	Limestone	2	Air Correction Division, UOP
Walker Co. 1	Huntsville	Texas	720	1.49	Process not selected	6	Vendor not selected
Walker Co. 2	Huntsville	Texas	720	1.49	Process not selected	6	Vendor not selected
Southwestern Public Service							
South Plains	Idalo	Texas	572		Process not selected	6	Vendor not selected
Springfield City Utilities							
Southwest 1	Springfield	Missouri	194	3.50	Limestone	1	Air Correction Division, UOP
Springfield Water, Light and Power							
Dallman 3	Springfield	Illinois	205	3.05	Limestone	1	Research-Cottrell
Sunflower Electric							
Holcomb 1	Holcomb	Kansas	347	0.34	Lime/spray drying	1	Joy Mfg/Niro Atomizer
Tampa Electric							
Big Bend 4	Tampa	Florida	458	3.50	Limestone	2	Research-Cottrell
Tennessee Valley Authority							
Paradise 1	Paradise	Kentucky	704	3.20	Limestone	1	GE Environmental Services
Paradise 2	Paradise	Kentucky	704	3.20	Limestone	1	Combustion Engineering
Widows Creek 7	Bridgeport	Alabama	575	3.70	Limestone	1	Combustion Engineering
Widows Creek 8	Stevenson	Alabama	550	3.30	Limestone	1	Tennessee Valley Authority
Texas Municipal Power Agency							
Gibbons Creek 1	Carlos	Texas	443	1.06	Limestone	1	Combustion Engineering
Texas Power and Light							
Sandow 4	Rockdale	Texas	545	1.60	Limestone	1	Combustion Engineering
Twin Oaks 1	Bremond	Texas	750	0.70	Limestone	3	GE Environmental Services
Twin Oaks 2	Bremond	Texas	750	0.70	Limestone	3	GE Environmental Services
Texas Utilities							
Forest Grove 1	Athens	Texas	750	0.80	Limestone	3	Wheelabrator Air Pollution
Martin Lake 1	Tatum	Texas	793	0.90	Limestone	1	Research-Cottrell
Martin Lake 2	Tatum	Texas	793	0.90	Limestone	1	Research-Cottrell
Martin Lake 3	Tatum	Texas	793	0.90	Limestone	1	Research-Cottrell
Martin Lake 4	Tatum	Texas	750	0.90	Limestone	3	Research-Cottrell
Monticello 3	Mt. Pleasant	Texas	800	0.50	Limestone	1	GE Environmental Services

TABLE 3. (continued)

Company name/unit name	City	State	Capacity, MW (gross)	Fuel % sulfur	FGD process	FGD status[a]	System supplier
Tucson Electric Power							
Springerville 1	Springerville	Arizona	370	0.61	Lime/spray drying	2	Joy Mfg/Niro Atomizer
Springerville 2	Springerville	Arizona	370	0.61	Lime/spray drying	3	Joy Mfg/Niro Atomizer
Springerville 3	Springerville	Arizona	370	0.61	Process not selected	6	Vendor not selected
United Power Association							
Stanton 1A	Stanton	North Dakota	60	0.77	Lime/spray drying	1	Research-Cottrell
Utah Power and Light							
Hunter 1	Castle Dale	Utah	420	0.52	Lime	1	GE Environmental Services
Hunter 2	Castle Dale	Utah	420	0.52	Lime	1	GE Environmental Services
Hunter 3	Castle Dale	Utah	400	0.55	Limestone	1	GE Environmental Services
Huntington 1	Huntington	Utah	432	0.43	Lime	1	GE Environmental Services
Naughton 3	Kemmerer	Wyoming	330	0.55	Sodium carbonate	1	Air Correction Division, UOP
Washington Water Power							
Creston Coal 1	Creston	Washington	570		Limestone	6	Vendor not selected
Creston Coal 2	Creston	Washington	570		Limestone	6	Vendor not selected
Creston Coal 3	Creston	Washington	570		Limestone	6	Vendor not selected
Creston Coal 4	Creston	Washington	570		Limestone	6	Vendor not selected
West Penn Power							
Mitchell 33	Courtney	Pennsylvania	300	2.80	Lime	1	GE Environmental Services
West Texas Utilities							
Oklaunion 1	Oklaunion	Texas	720	0.34	Limestone	2	GE Environmental Services
Oklaunion 2	Oklaunion	Texas	720	0.34	Process not selected	6	Vendor not selected
White Pine County							
White Pine Power Project 1	Ely	Nevada	820	0.60	Process not selected	6	Vendor not selected
White Pine Power Project 2	Ely	Nevada	820	0.60	Process not selected	6	Vendor not selected

[a] FGD status codes are defined as:

1. Operational units
2. Units under construction
3. Planned - contract awarded
4. Planned - letter of intent signed
5. Planned - requesting/evaluating bids
6. Planned - considering only FGD systems for SO_2 compliance

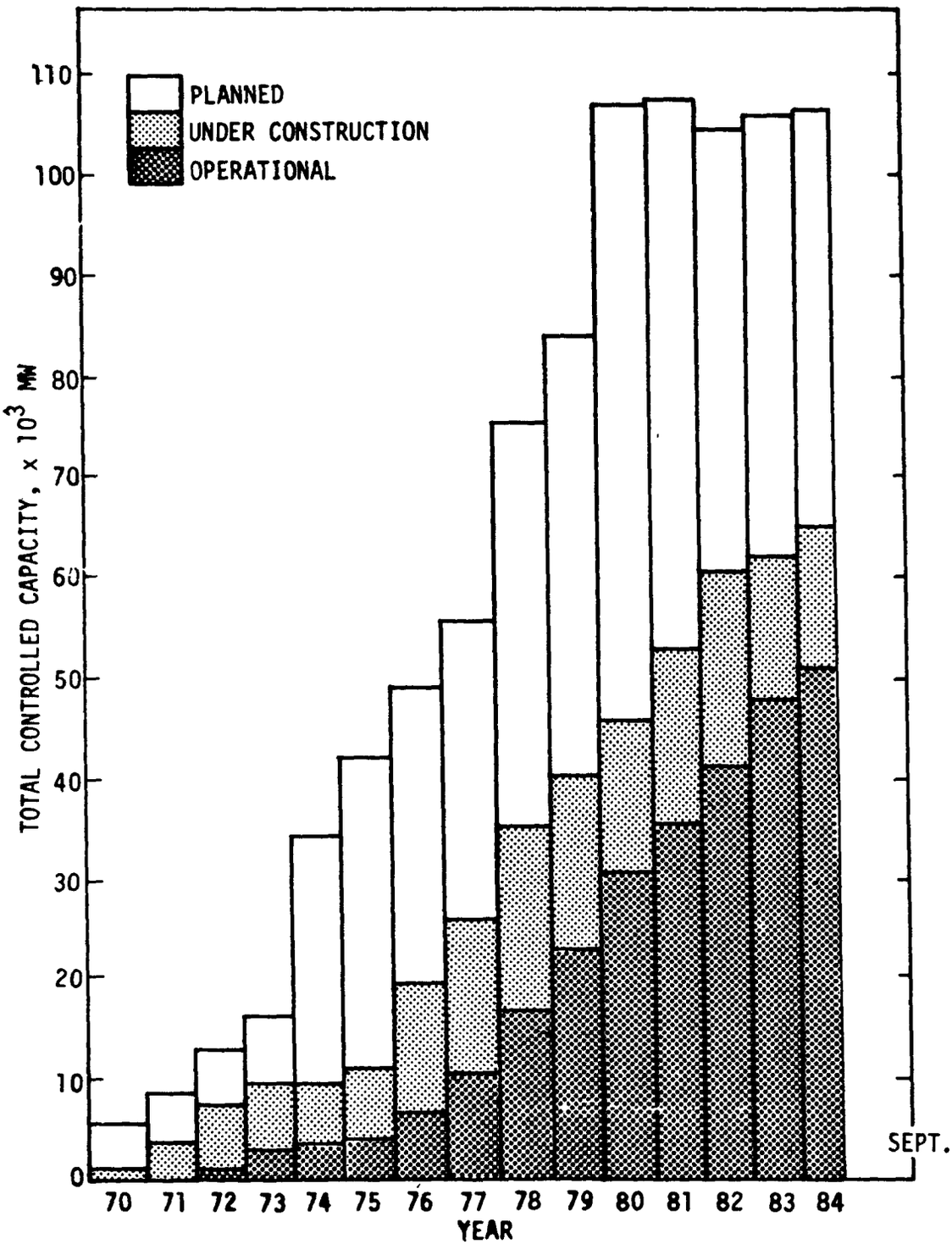

Figure 2. History of utility FGD status reports for operational, under construction, and planned FGD capacity - December 1970 through September 1984.

Figure 3 presents a comparison of actual coal-fired generating capacity and FGD capacity from 1975 through 1984 and projections thereafter through 1992. Although the retirement of older units is taken into account in these plots, such retirements affect only the overall coal-fired capacity rate because FGD-controlled capacity represents primarily new power generating capacity. This accounts for the slightly greater slope of the lower line, which depicts FGD-controlled capacity.

Current projections estimate the total power-generating capacity of the U.S. electric utility industry will be 791 GW by the end of 1992.[6] (This value reflects the loss resulting from the retirement of older units, which is considered to be approximately 3.24 GW by the end of 1992.[7]) Approximately 345 GW, or 44 percent of the 1992 total, is estimated to be produced by coal-fired units. Table 4 presents a distribution of present (December 1983) and future (December 1992) power generation sources.

TABLE 4. POWER GENERATION SOURCES: PRESENT AND FUTURE[6,7]

	Coal	Nuclear	Oil	Hydro	Gas	Other	Total generating capacity, GW
December 1983	43%	11%	20%	12%	13%	1%	671
December 1992	44%	16%	17%	11%	11%	1%	791

It is interesting to note that the breakdown for the actual power produced by these sources during the past year (Table 5) differs appreciably, especially for coal- and oil-fired sources, from the power generating capacity shown in Table 4. This is due to the effect of the changing economy on the operation of various types of powerplants.

TABLE 5. POWER PRODUCTION BY SOURCE[8]

	Coal	Nuclear	Oil	Hydro	Gas	Other	Total energy generated, GWh
January-December 1983	55%	13%	6%	14%	12%	0	2,308,746

Based on known commitments of utilities to FGD (as presented in Table 1) and other coal-fired generating capacity expected to be required to incorporate FGD (Figure 3), current and projected percentages of electrical generating capacity controlled by FGD are shown in Table 6.

Table 7 shows both the current (September 1984) and projected (December 1999) breakdown of throwaway-product FGD systems

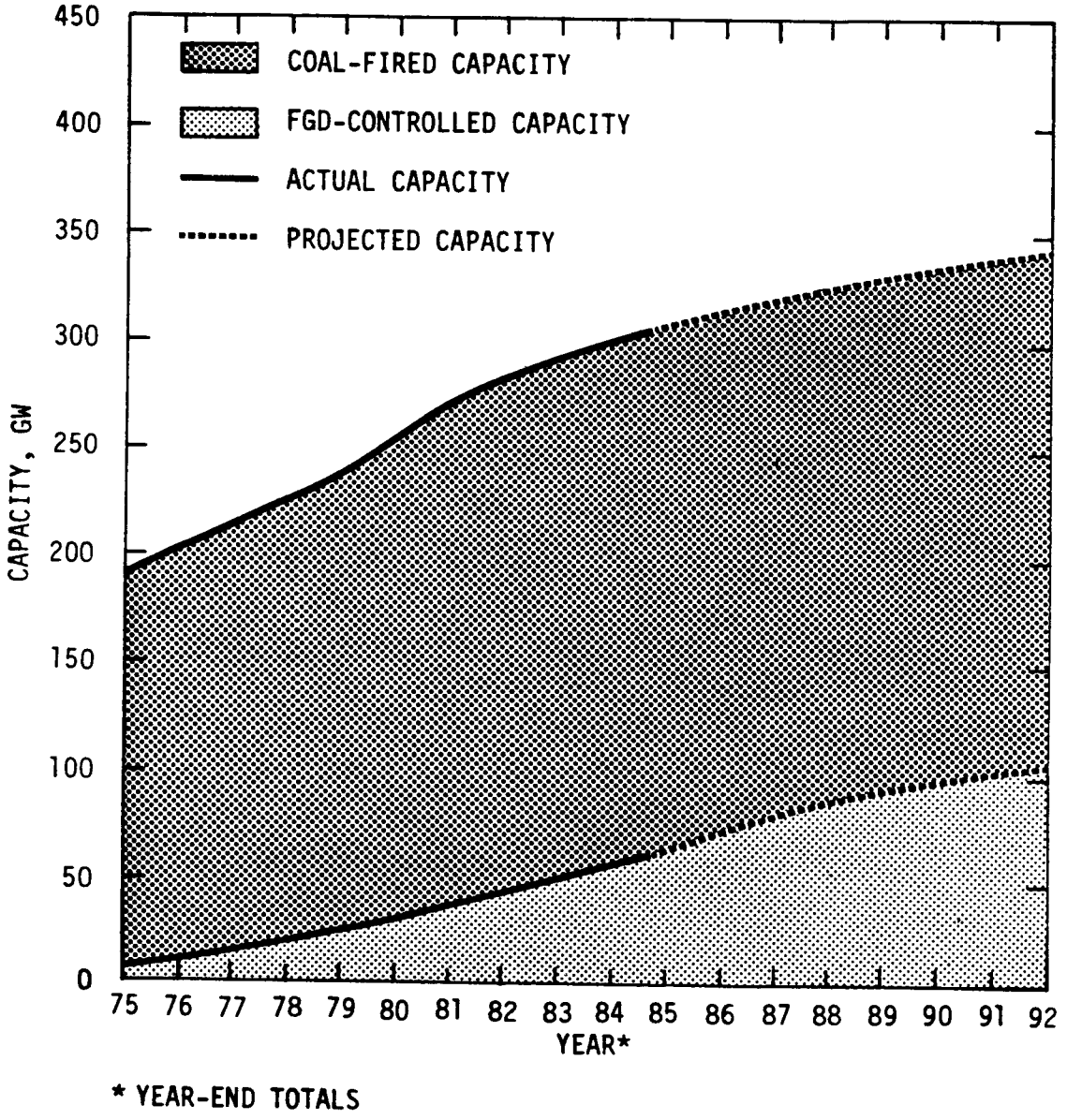

Figure 3. Actual and projected coal-fired generating capacity and FGD capacity, 1984.[1-7]

TABLE 6. FGD-CONTROLLED GENERATING CAPACITY: PRESENT AND FUTURE[1,6]

	Coal-fired generating capacity controlled by FGD, %	Total generating capacity controlled by FGD, %
September 1984[a]	17.2	7.4
December 1992	31.0	13.6

[a]The September 1984 FGD capacity figures are based on reports by utilities. The figures used for the total generating capacity and the December 1992 coal-fired generating capacity are based on December 1982 DOE projected figures.

TABLE 7. SUMMARY OF FGD SYSTEMS BY PROCESS
(percentage of total MW)

Process	Byproduct	September 1984	December 1999	December 1999 (Normalized)[a]
Throwaway-product process				
Wet systems				
Lime		23.9	13.2	16.0
Limestone		46.7	43.1	52.2
Lime/alkaline flyash		7.7	4.3	5.2
Limestone/alkaline flyash		3.2	1.5	1.8
Dual alkali		3.3	2.2	2.7
Sodium carbonate		3.2	3.1	3.7
NA[b]		-	1.8	2.1
Dry systems				
Lime		4.8	6.2	7.5
Sodium carbonate		0.9	0.4	0.5
NA[b]		-	2.2	2.7
Dry injection				
Trona/dry injection		-	0.5	0.6
Saleable-product process				
Aqueous carbonate/ spray drying	Elemental sulfur	0.2	0.1	0.1
Limestone	Gypsum	0.4	1.4	1.7
Magnesium oxide	Sulfuric acid	1.5	0.7	0.9
Wellman Lord	Sulfuric acid	4.2	1.9	2.3
Process undecided		-	17.4	-
TOTAL		100.0	100.0	100.0

[a]The effect of those systems listed as "Process undecided" is removed.

[b]NA - Not available (These systems are committed to a throwaway-product process; however, the actual process is unknown at this time.)

versus salable-product FGD systems as a percentage of the total known commitments to FGD.

Table 8 presents categorical FGD system cost data in common 1981 dollars.

TABLE 8. CATEGORICAL RESULTS OF THE REPORTED AND ADJUSTED CAPITAL AND ANNUAL COSTS FOR OPERATIONAL FGD SYSTEMS

	Reported						Adjusted					
	Capital			Annual			Capital			Annual		
	Range, $/kW	Average, $/kW	σ	Range, mills/kWh	Average, mills/kWh	σ	Range, $/kW	Average, $/kW	σ	Range, mills/kWh	Average, mills/kWh	σ
All	23.7-213.6	80.2	44.3	0.1-13.0	2.3	2.8	38.3-282.2	118.8	58.1	1.6-20.8	7.6	4.1
New	23.7-213.6	80.4	46.1	0.1- 5.5	1.7	1.8	38.3-263.9	110.8	48.4	1.6-14.6	6.8	3.2
Retrofit	29.4-157.4	79.7	39.4	0.5-13.0	4.5	4.4	60.4-282.2	139.3	73.8	4.3-20.8	9.7	5.3
Saleable	132.8-185.0	153.1	20.6	13.0-13.0	13.0	0.0	254.6-282.2	271.6	12.1	16.7-20.8	18.1	1.9
Throwaway	23.7-213.6	75.8	41.5	0.1-11.3	2.1	2.4	38.3-263.9	110.9	47.6	1.6-17.6	7.0	3.4
Alkaline flyash/lime	43.4-173.8	93.9	44.0	0.4- 5.4	2.1	1.9	52.5-184.4	122.8	51.4	3.0-14.1	7.2	3.8
Alkaline flyash/ limestone	49.3- 49.3	49.3	0.0	0.8- 0.8	0.8	0.0	102.6-102.6	102.6	0.0	5.4- 5.4	5.4	0.0
Dual alkali	47.2-174.8	97.8	55.3	1.3- 1.3	1.3	0.0	87.8-263.9	146.7	82.9	5.0-13.9	8.7	3.8
Lime	29.4-213.6	81.8	43.7	0.3-11.3	3.2	2.7	60.4-210.0	116.5	44.2	4.0-17.6	8.1	3.6
Limestone	23.7-170.4	67.9	37.2	0.1- 7.8	1.6	2.2	38.3-194.3	98.9	44.0	1.6-14.6	6.1	3.1
Sodium carbonate	42.9-100.8	69.2	26.6	0.2- 0.5	0.4	0.1	87.1-150.9	110.9	26.4	5.8- 7.4	6.4	0.7
Wellman Lord	132.8-185.0	153.1	20.6	13.0-13.0	13.0	0.0	254.6-282.2	271.6	12.1	16.7-20.8	18.1	1.9

HIGHLIGHTS: OCTOBER 1983-SEPTEMBER 1984

The following paragraphs highlight FGD system developments during the period of October 1983 through September 1984.

Arizona Electric Power reported that the Apache 2 and 3 limestone FGD systems demonstrated high dependabilities during the months of October 1983 through July 1984. No major FGD-related problems were encountered.

Arizona Public Service announced plans to construct a new unit, Cholla 5, in Joseph City, Arizona. The 375-MW (gross) pulverized-coal-fired boiler (supplied by Combustion Engineering) will have an FGD system for the control of SO_2 emissions. The unit is scheduled to start up in 1997.

Atlantic City Electric announced that they have postponed indefinitely their plans to install Cumberland 1 in Milville, New Jersey, because power demand has not met projections.

Basin Electric Power reported that the limestone FGD systems on Laramie River 1 and 2 achieved high dependabilities during most of the period. Minor FGD-related problems encountered included maintenance on welds in the quencher section on Unit 2 and repairs to the absorber recycle and feed tank mixers on both units.

Big Rivers Electric reported that initial operation of the FGD system on D. B. Wilson 1 in Centertown, Kentucky, began in September 1984. This 440-MW (gross) unit fires coal with an average sulfur content of 3.75 percent. The emission control system consists of an ESP followed by an M. W. Kellogg wet-lime FGD system.

New Boston 1 and 2 of Boston Edison in Boston, Massachusetts, are being converted from oil- to coal-fired units. The 388-MW (gross) Babcock and Wilcox units will fire subbituminous coal with an average sulfur content of 2.3 percent and heat content of 12,600 Btu/lb. Bids are currently being requested/evaluated for a wet-limestone FGD system with salable gypsum byproduct recovery. Particulate control will be provided by ESP's, and the flue gas will exit via a 359-ft acid-brick-lined stack. Forced oxidation will be

utilized for sludge treatment. New Boston 1 and 2 are scheduled to start up in October 1987 and June 1988 respectively.

Cajun Electric Power announced that their plans to install Oxbox 1 in De Soto Parish, Louisiana, have been postponed indefinitely because power demand has not met projections.

Central Illinois Light reported that the Duck Creek 1 limestone FGD system demonstrated high dependabilities during the period of October 1983 through July 1984, except during May, when the FGD system was down for general inspection and maintenance. The utility also announced that they had cancelled plans for the construction of a second unit at the Duck Creek Station in Canton, Illinois, because of a reduction in projected power demand.

Central Illinois Public Service reported that the Newton 1 dual-alkali FGD system demonstrated high dependabilities during the period of October 1983 through August 1984, except for June, when the FGD system was down because of repairs to the absorber tower lining.

Cincinnati Gas and Electric announced plans to convert the Zimmer 1 nuclear facility in Moscow, Ohio, to coal. The retrofit 1386-MW (gross) coal-fired boiler will have an FGD system for control of SO_2 emissions. The unit is scheduled to start up in 1991.

Colorado Ute Electric indicated that initial operation of the FGD system on Craig 3 in Craig, Colorado, commenced in June 1984. This 447-MW (gross) unit fires coal with an average sulfur content of 0.45 percent. Babcock and Wilcox supplied this lime/spray drying process. A fabric filter is used for particulate removal.

Cooperative Power, not Buckeye Power as previously reported, plans to construct a 750-MW (gross) unit in Ohio. The facility has not yet been named, nor has a site been finalized. This unit is expected to fire Ohio coal. A wet-limestone FGD system will control SO_2 emissions, and ESP's will control particulate emissions. Initial startup is tentatively scheduled for 1994.

Deseret Generating and Transmission reported that initial operation of the FGD system on Bonanza 1 in Vernal, Utah, began in September 1984. This 410-MW (gross) unit fires coal with an average sulfur content of 0.5 percent. Combustion Engineering supplied the wet-limestone FGD system. A fabric filter supplied by Ecolaire is used to control particulate emissions. The unit operates in a closed-water-loop mode and the sludge is disposed of in an onsite landfill.

General Public Utilities, not Jersey Central Power & Light as previously reported, will be the operating utility of the 690-MW (gross) Cone 1 unit (reported earlier as 625 MW). The unit and FGD system are still in the planning stage. The coal-fired (3.5 percent sulfur) unit is scheduled to start up sometime in 1993.

Iowa Electric Light and Power announced that they are postponing indefinitely their plans to install Guthrie County 1 in Panora, Iowa, because power demand has not met projections.

Kentucky Utilities announced that they have postponed indefinitely their plans to install a second unit at the Hancock station in Hawesville, Kentucky, because of a reduction in projected power demand.

The Los Angeles Department of Water and Power reported that the FGD system on Intermountain 2 in Delta, Utah, is now under construction. Fabric filters will control particulate emissions from this 820-MW (gross) unit. The wet limestone FGD system will control SO_2 in the flue gas downstream from the particulate collection equipment. Flue gas reheat will be provided by in-line heat exchangers prior to the 710-foot stack. The fly ash-stabilized sludge will be disposed of on site at this closed-loop facility. The unit is expected to begin operations in July 1987.

The Lower Colorado River Authority reported that the Fayette Power Project 3 in La Grange, Texas, is now under construction. This lignite-fired 451-MW (gross) unit will be equipped with a wet-limestone FGD system designed to remove 90 percent of the SO_2. An ESP supplied by Flakt will control particulate emissions, and the cleaned flue gas will exit through a 535-ft acid-brick-lined stack. Sludge will be disposed of in an onsite landfill. The unit is expected to begin operations in November 1987. The utility also announced plans to construct a fourth unit at the Fayette Power Project Station in La Grange, Texas. This lignite-fired (1.7 percent sulfur, 4300 Btu/lb) boiler will also use a wet-limestone FGD system for SO_2 control and ESP's for particulate removal. Initial startup is scheduled for June 1990.

Middle South Utilities announced the cancellation of their plans to install Arkansas Lignite 5 and 6 and two other plants (name undecided), which were to be located in Louisiana. The utility has also announced that they have postponed indefinitely their plans to install Wilton 1 and 2 in Convent, Louisiana, because of a reduction in projected power demand.

Minnesota Power and Light reported that the Clay Boswell 4 lime/alkaline fly ash FGD system demonstrated high dependabilities during the months of October 1983 through June 1984. No major FGD-related problems were encountered.

Minnkota Power reported that the Milton R. Young 2 lime/alkaline fly ash FGD system demonstrated high dependability during the period of October 1983 through June 1984, except during December and January, when the system was shut down for repairs on the absorber spray recycle system.

Montana Power reported that initial operation of the FGD system on Colstrip 3 in Colstrip, Montana, began in October 1983. This 778-MW (gross) unit fires low-sulfur coal (0.7 percent sulfur, 8500 Btu/lb). The lime/alkaline fly ash FGD system was supplied by Bechtel/Montana Power. Particle scrubbers are used to control particulate emissions, and the system operates in a closed-water-loop mode. Flue gas exits via a 692-ft stack.

New York State Electric and Gas indicated that initial operation of the FGD system on Somerset 1 in Somerset, New York, began in September 1984. This 625-MW (gross) unit fires coal with an average sulfur content of 2.2 percent. A cold-side ESP with a design efficiency of 99.7 percent is used for particulate control. The wet-limestone FGD system was supplied by Peabody Process Systems. The system operates in a closed-water-loop mode, and the flue gas exits via a 450-ft stack. The sludge is dewatered and stabilized before being landfilled.

Nevada Power reported that the Reid Gardner 1, 2, 3, and 4 sodium carbonate FGD systems demonstrated high dependabilities during the months of October 1983 through August 1984. Only minor FGD-related problems were encountered.

Northern Indiana Public Service reported that the Schahfer 17 dual-alkali FGD system demonstrated high dependabilities during the months of October 1983 through July 1984. No major FGD-related problems were encountered.

Orlando Utilities Commission announced that the Combustion Engineering wet-limestone FGD system on C. H. Stanton 1 in Orlando, Florida, is now under construction. The utility will control particulate emissions with an ESP. Initial startup is scheduled for 1987.

Pacific Power and Light announced that construction of the retrofit wet sodium carbonate FGD system on Jim Bridger 2 began during the first quarter of 1984. The retrofit system will treat 2,700,000 acfm of flue gas from a 550-MW (gross) bituminous coal-fired boiler located in Rock Springs, Wyoming. A cold-side ESP is currently in operation for primary particulate control. The FGD system will operate in a closed-water-loop mode and flue gas will exit via a 500-ft stack. The FGD system is scheduled to start up in 1986. The utility also announced that a contract has been awarded to Joy

Manufacturing/Niro Atomizer for a retrofit lime/spray-drying system to control particulate matter and SO_2 emissions from Wyodak 1. This 330-MW (gross) mine mouth plant is located in Joliet, Wyoming, and has been operational since 1978. The FGD system is scheduled to start up in 1986.

The Platte River Power Authority reported that initial operation of the FGD system on Rawhide 1 in Wellington, Colorado, began in December 1983. The 279-MW (gross) unit supplied by Combustion Engineering fires low-sulfur coal (0.34 percent sulfur, 8500 Btu/lb). Joy Manufacturing/Niro Atomizer supplied the dry-lime FGD system for SO_2 control and the fabric filters for particulate removal. The system operates in a closed-water-loop mode, and sludge is disposed of in a landfill. Flue gas exits via a 505-ft stack.

Public Service Company of Colorado has plans for a new unit, Pawnee 2, to be located near Rush, Colorado. The 500-MW (gross) Babcock & Wilcox boiler will fire subbituminous coal (0.35 percent sulfur, 8290 Btu/lb). Fabric filters will be utilized for particulate removal and SO_2 emissions will be controlled through injection of dry trona. The trona will be pulverized and blown into the ductwork upstream of the fabric filter system for contact with flue gas on the duct and fabric filter surfaces. Flue gas will exit via a 500-ft stack. Initial startup of the unit is scheduled for 1990.

Public Service of New Mexico reported that the San Juan 1, 2, and 3 Wellman Lord FGD systems achieved high dependabilities for most of the period. Minor FGD-related problems encountered included replacing the absorber lining, repairing absorber trays, and replacing broken mist eliminator pads.

San Antonio Public Service reported plans to construct four new units (name and location undecided) instead of two, as previously reported. The lignite-fired (1 to 2 percent sulfur, 5600 Btu/lb) units will have a gross megawatt rating of 500 each and each will have a wet-limestone FGD system. The four units are scheduled to commence operations in 1993, 1995, 1999, and 2001, respectively.

Seminole Electric reported that initial operation of the FGD system on Seminole 2 in Palatka, Florida, began in September 1984. This 620-MW (gross) unit fires coal with an average sulfur content of 2.75 percent. The Peabody Process Systems wet-limestone FGD system is downstream of an ESP used for particulate control. The cleaned flue gas exits via a 675-ft stack. The utility also announced they have indefinitely postponed their plans to install Taylor 1 and 2 in Perry, Florida, because power demand has not met projections.

South Carolina Public Service reported that initial operation of the FGD system on Cross 2 in Cross, South Carolina, began in October 1983. This 450-MW (gross) unit fires coal with an average sulfur content of 1.8 percent. The wet-limestone scrubbing system, supplied by Peabody Process Systems, controls SO_2 emissions, and a cold-side ESP controls particulate emissions. The system operates in a closed-water-loop mode, and the cleaned flue gas exits via a 600-ft stack. The utility also announced that the Winyah 2 limestone FGD system achieved high dependabilities during the months of October 1983 through March 1984. Minor FGD-related problems encountered included cleaning the mist eliminators and repairing frozen slurry and water pipe lines.

South Mississippi Electric Power reported that the R. D. Morrow, Sr. 1 and 2 limestone FGD systems demonstrated high dependabilities during the period of October 1983 through July 1984 except for October. The R. D. Morrow, Sr. 1 FGD system was off line most of October for absorber ductwork repairs and the other FGD system was also unavailable that month because of scheduled maintenance.

Southern Indiana Gas and Electric announced that the FMC dual-alkali FGD system on A. B. Brown 2 in West Franklin, Indiana, is now under construction. The 265-MW (gross) unit will fire bituminous coal (3.35 percent sulfur, 11,100 Btu/lb). A cold-side ESP will provide primary particulate matter control. The cleaned flue gas will exit via a 498-ft stack. The system will operate in a closed-water-loop mode, and the sludge will be disposed of in an onsite landfill. Operation of the FGD is scheduled to start up in January 1985.

Southwestern Public Service reported that the wet-limestone FGD system on Dolet Hills 1 in Mansfield, Louisiana, is now under construction. Flue gas from this 720-MW (gross) lignite-fired unit will exit via a 525-ft stack, and the system will operate in a closed-water-loop mode. Initial startup is scheduled for December 1985.

Southwestern Public Service announced plans to construct a new unit, South Plains 1, to be located near Idalou, Texas. The 572-MW (gross) unit will burn low-sulfur Western coal and will be equipped with an FGD system to control SO_2 emissions. Initial startup is scheduled for 1990.

United Power Association reported that the Stanton 1A lime/spray drying FGD system demonstrated high dependabilities during the months of October 1983 through June 1984. No major FGD-related problems were encountered.

West Texas Utilities reported that the GEESI wet-limestone FGD system on Oklaunion 1 in Oklaunion, Texas, is now under construction. The 720-MW (gross) coal-fired unit will also be equipped with a Lodge-Cottrell rigid-frame, cold-side ESP for particulate control. The system will operate in a closed-loop mode, and the cleaned flue gas will exit via a 453-ft acid-brick-lined stack. Initial operations are scheduled for September 1986.

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16. ABSTRACT

This report, which is generated by a computerized data base system, represents a survey of operational and planned domestic utility flue gas desulfurization (FGD) systems. It summarizes information contributed by the utility industry, system and equipment suppliers, system designers, research organizations, and regulatory agencies. The data cover system design, fuel characteristics , history of utility FGD operating status nationwide, and capital and annual costs for operating FGD systems. The development status (operational, under construction, or in the planning stages), system supplier, and process are tabulated alphabetically by utility company. Also included are highlights of FGD system developments during the period of October 1983 through September 1984.

Current data for domestic FGD systems show 124 systems in operation, 25 systems under construction, and 68 systems planned. The current FGD-controlled capacity in the United States is 47,255 MW.

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