

Top Source Categories Contributing to Regional Haze in Mid-Atlantic North Eastern Class I Areas

Source Category	SCCs	Control Option	Percent Reduction (Refers to SO2 unless otherwise specified)	Cost Effectiveness (\$/ton) [Refers to SO2 unless otherwise specified]
Electric Generating Units	1-01-xxx-xx	Fuel Switching from Bituminous to Subbituminous Coal	70	
		Fuel Switching from Coal to Natural Gas	>99	
		Fuel Cleaning (Coal)	20-25	
		FGD (Dry) High S Coal	40	
		FGD (Dry) Low S Coal	40	
		FGD (Spray Dry)	80-90	\$150-\$4000
		FGD (Wet) High S Coal	>90	\$200-\$5000
		FGD (Wet) Low S Coal	>90	\$200-\$5000
		Reduced S Residual Oil	Variable (directly related to fuel Sulfur content)	
Industrial, Commercial, and Institutional Boilers	1-02-xxx-xx, 1-03-xxx-xx, A21-02-001-000, A21-02-002-000, A21-02-004-000, A21-02-005-000, A21-03-001-000, A21-03-002-000, A21-03-004-000, A21-03-005-000	FGD (Dry) High S Coal	40	\$600-\$3,500
		FGD (Dry) Low S Coal	40	\$700-\$4,300
		FGD (Spray Dry)	90	\$400-\$3,920
		FGD (Wet) High S Coal	90	\$400-\$3,500
		FGD (Wet) Low S Coal	90	\$500-\$4,500
		FGD - Oil	90	\$700-\$10,160
		Wet ESP - Wood (1)	80-95	
		Spray Dry w/ESP - Wood (1)	60-75	
		Spray Dry w/Fabric Filter - Wood (1)	65-80	
		Dry FGD and ESP - Wood (1)	60-70	
		Dry FGD and Fabric Filter - Wood (1)	70-80	
		Spray Dry, Dry FGD and Fabric Filter - Wood (1)	80-90	
		ESP and wet FGD - Wood (1)	50-95	
		Fuel Switching from Bituminous to Subbituminous Coal	70	
		Fuel Switching from Coal to Natural Gas	>99	
		Fuel Cleaning (Coal)	20-25	
				Reduced S Residual Oil
Residential Wood Combustion and Open Burning	A21-04-008-xxx, A26-10-030-000	Reduce or eliminate wood burning (fireplace and woodstove)	PM/woodsmoke reduction	
		Use of high efficiency / less polluting woodstove technology (specially designed catalytic/non-catalytic woodstoves and pellet burners) [compare to Washington/Oregon standards for similar units]	10-20 reduction in PM/woodsmoke (compared to conventional woodstove)	\$2,000 (based on cost of conventional woodstove replacement)
		Adopting good burning techniques such as using properly sized and properly seasoned wood	Reduction in PM/woodsmoke	
Home Heating Oil	A21-04-004-000, A21-04-005-000	Reduced Sulfur Fuel (2,500 ppm S --> 500 ppm S --> 15 ppm S)	Variable (directly related to fuel Sulfur content)	low Sulfur fuel (500 ppm S) costs ~\$0.01/gallon more than conventional fuel (2,500 ppm S)
		Improved Efficiency Boilers/Furnaces		
Cement Kilns	3-05-006-xx, 3-05-007-xx	Cement Kiln Feedstock Control (Low Sulfur Feed)	70-90	
		Fabric Filter with Absorbing Agent (Calcium Oxide)	50	
		Advanced FGD Systems	95-99.5	\$2,000-\$4,000 (Long Dry Kiln) / \$13,600-\$38,600 (Preheater Kiln)
		FGD (Wet)	90-99	\$2,000-\$6,200 (Long Dry Kiln) / \$9,700-\$64,600 (Preheater Kiln)
		Dry FGD	90-95	\$1,900-\$7,000 (Long Dry Kiln) / \$10,000-\$72,800 (Preheater Kiln)
		Lime Spray Injection w/ Fabric Filter or ESP		
Lime Kilns	3-07-001-06	Alkaline Scrubbers		

Information on control options from:

1. Assessment of Control Technology Options for BART-Eligible Sources, NESCAUM, March 2005
2. Controlling Fine Particulate Matter Under the Clean Air Act: A Menu of Options, STAPPA-ALAPCO, March 2006

Note (1): Referenced control also reduces PM emissions by 95 - 99.9%.

Top 16 Sources Contributing to Regional Haze in Mid-Atlantic North Eastern Class I Areas

Number	State	Facility ID	Facility	Primary Emissions Point Descriptions (1)	Point Number (1)	SCC (1)	BART Source	2002 SO2 Total (Tons) (1,2)	Design Capacity (1)	Existing Control (1)	Control Option	Percent Reduction	Ton per Year Reduction	Cost Effectiveness (\$/Ton) (5)		
1	DE	100030016	MOTIVA ENTERPRISES LLC - DELAWARE CITY (3)	Field Coker CO Boiler	002			29,747								
				Cracker CO Boiler	012		10201402 10201402		18,327 11,420	676 E8BTU 676 E8BTU	99.1% (Regenerative Wet Gas Scrubber) 99.1% (Regenerative Wet Gas Scrubber)			15,000 13,000	\$3,500 (current) \$3,500 (current)	
2	NY	8261400205	KODAK PARK DIVISION	Coal and Residual Boiler	U00015		yes	23,508								
							10200401, 10200026, 10200203, 10200501, 10200202		23,797				40 40 40 90 90 20-25 90	9,519 9,519 21,417 21,417 21,417 5,949 21,417	\$600-\$3,500 \$700-\$4,300 \$400-\$3,920 \$400-\$3,500 \$500-\$4,500 \$700-\$10,160	
3	OH	0671010028	MW CUSTOM PAPERS LLC - CHILlicothe MILL					23,216								
4	TN	0903	EASTMAN CHEMICAL COMPANY	14 Coal Stoker Boilers	020101			22,882								
				5 Coal Tangential Boilers	021520		10200202		1,645	967 E8BTU			40 40 90 90	9,153 9,153 20,594 20,594	\$600-\$3,500 \$700-\$4,300 \$400-\$3,920 \$500-\$4,500	
				2 Coal Tangential Boilers	261501		10200202		1,663	E8BTU			20-25 90	5,721 5,721	\$700-\$10,160	
5	MD	001-0011	WESTVACO FINE PAPERS	Coal Cyclone Boiler	1		yes	19,083								
				Coal Tangential Boiler	2		10200203 10200212		10,160 8,923				40 40 90 90 20-25	7,633 7,633 17,175 17,175 4,771	\$600-\$3,500 \$700-\$4,300 \$400-\$3,920 \$400-\$3,500 \$500-\$4,500	
6	NY	4012400001	LAFARGE BUILDING MATERIALS INC	Cement Kiln	041000		yes	14,800								
7	WV	0002	PPG INDUSTRIES INC	Coal Boiler	001			12,678								
				Coal Boiler	002		10200202		3,538				40 40 90 90 20-25	5,071 5,071 11,410 11,410 3,170	\$600-\$3,500 \$700-\$4,300 \$400-\$3,920 \$400-\$3,500 \$500-\$4,500	
				Coal Boiler	003		10200202		7,071							
8	IL	179060ACR	WILLIAMS ETHANOL SERVICES INC					12,244								
9	IL	031012ABI	CORN PRODUCTS INTERNATIONAL INC					9,281								
10	PA	421330016	PH GLATFELTER CO/SPRING GROVE	Coal Boiler	034		yes	7,855								
				Coal Boiler	035		10200202 10200202		4,287 3,568	963.7 E8BTU 262.3 E8BTU			40 40 90 90 90 20-25	3,142 3,142 7,070 7,070 7,070 1,964	\$800-\$2,500 \$800-\$3,000 \$600-\$2,600 \$500-\$2,700 \$700-\$3,500	
11	OH	1677010193	GOODYEAR TIRE & RUBBER CO.					5,903								
12	VA	00001	Stone Container Corp (d/b/a Smurfit-Stone Contain)	Coal Tangential Boiler	2			3,379	1056 Ton							
							10200212		3,379			40 40 90 90 90 20-25	1,352 1,352 3,041 3,041 3,041 845	\$600-\$3,500 \$700-\$4,300 \$400-\$3,920 \$400-\$3,500 \$500-\$4,500		
13	NY	4192600021	ST LAWRENCE CEMENT CORP-CATSKILL QUARRY	Cement Kiln	U00K18		yes	3,329								
14	ME	2301900056	GREAT NORTHERN PAPER INC MILL WEST	Residual Oil Boiler	001		yes	1,842								
				Residual Oil Boiler	002		10200401		1,069	370 E8BTU			90 90 90 90	944 849 158 1,658	\$700-\$7,801 \$700-\$7,801 \$700-\$7,801 \$700-\$7,801	
				Residual Oil Boiler	003		10200401		1,75	370 E8BTU						
				Residual Oil Boiler	004		10200401		1,842	740 E8BTU						
				Residual Oil Boiler	005		10200401		528	592 E8BTU		99.4%				
15	DE	1000100127	NRG ENERGY CENTER DOVER LLC	Wall Fired Coal Boiler	001			1,836	243 E8BTU							
16	ME	2302500027	SAPPI - SOMERSET	Multi-fuel Boiler	001		yes	1,734								
							10200401, 10200902, 10200903, 10200799, 10201301		2,994	848 E8BTU			90 80-95 60-75 65-80 60-70 70-90 80-90 50-95	2,695 2,395-2,844 1,796-2,245 1,946-2,395 1,796-2,096 2,096-2,096 2,395-2,695 1,487-2844		

Information on control options from:
 1. Assessment of Control Technology Options for BART-Eligible Sources, NESCAUM, March 2005
 2. Controlling Fine Particulate Matter Under the Clean Air Act: A Menu of Options, STAPPA-ALAPCO, March 2006

Note: BART Sources outside of MANE-VU have not been identified.

Note (1): Emission source description, point number, point source emissions, SCC, design capacity, existing control information is from the 2002 NEI.
 Note (2): Bolded emission source totals are 2002 emissions supplied by MARAMA.
 Note (3): Source has installed or is in the process of installing controls due to Consent Decree
 Note (4): Referenced control also reduces PM emissions by 95 - 99.9%.
 Note (5): Control costs vary by the size of the emission unit. Control of large emission units is generally more cost effective than controlling small units.

Number	State	Facility ID	Facility	Primary Emissions Point Descriptions
1	TN	D03406C10	JOHNSONVILLE	
2	OH	D028404	CONESVILLE	
3	PA	D031361	KEYSTONE	
4	OH	D02872C04	MUSKINGUM RIVER	
5	PA	D03179C01	HATFIELD'S FERRY	
6	OH	D02876C01	KYGER CREEK	
7	WV	D03935C02	JOHN E AMOS	
8	PA	D031362	KEYSTONE	
9	IN	D01010C05	WABASH RIVER	
10	PA	D031491	MONTOUR	
11	NC	D080421	BELEWS CREEK	
12	WV	D03948C02	MITCHELL	
13	PA	D031222	HOMER CITY	
14	PA	D031492	MONTOUR	
15	MD	D01571CE2	CHALK POINT	
16	MI	D01733C12	MONROE	
17	PA	D031221	HOMER CITY	
18	NC	D080422	BELEWS CREEK	
19	WV	D039432	FORT MARTIN	
20	WV	D039431	FORT MARTIN	
21	WV	D039353	JOHN E AMOS	
22	OH	D0283612	AVON LAKE	
23	VA	D037976	CHESTERFIELD	
24	PA	D082261	CHESWICK	
25	OH	D028281	CARDINAL	
26	MD	D015731	MORGANTOWN	
27	OH	D028667	W H SAMMIS	
28	MD	D015732	MORGANTOWN	
29	MA	D016193	BRAYTON POINT	
30	NJ	D023781	B L ENGLAND	

Point Number	SCC	BART Source	2002 SO2 Total (Tons)	Design Capacity	Existing Control
			103,342		
			86,999		
			85,690		
			82,298		
			78,684		
			71,591		
			62,427		
			61,899		
			59,703		
			59,506		
			57,069		
			54,858		
			54,560		
			49,727		
			47,781		
			45,286		
			45,260		
			44,642		
			44,614		
			41,919		
			41,728		
			40,863		
			40,201		
			39,741		
			36,872		
			36,270		
			33,116		
			30,395		
			19,073		
			9,344		

