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	Variable (directly related to fuel Sulfur content)	
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)	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		
Smelters	3-03-xxx-xx	Dry Scrubber, Lime Spray Dryer, and Low Sulfur Coal	92	

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	1000300016	MOTIVA ENTERPRISES LLC - DELAWARE CITY (3)					29,747						
				Fluid Coker CO Boiler	002	10201402	No	18,327	676 E6BTU	Yes	Regenerative Wet Gas Scrubber	99.1	15000	3500
				Cracker CO Boiler	012	10201402	No	11,420	679 E6BTU	Yes	Regenerative Wet Gas Scrubber	98.1	13000	3500
2	NY	8261400205	KODAK PARK DIVISION				yes	23,508						
				Coal and Residual Boiler	U00015	10200401, 10200206, 10200203, 10200501, 10200202		23,797			FGD (Dry) High S Coal	40	9,519	$600-$3,500
											FGD (Dry) Low S Coal	40	9,519	$700-$4,300
											FGD (Spray Dry)	90	21,417	$400-$3,920
											FGD (Wet) High S Coal	90	21,417	$400-$3,500
											FGD (Wet) Low S Coal	90	21,417	$500-$4,500
											FGD - Oil	90	21,417	$700-$10,160
3	OH	0671010028	MW CUSTOM PAPERS LLC - CHILLICOTHE MILL					23,216						
4	TN	0003	EASTMAN CHEMICAL COMPANY					22,882						
											FGD (Dry) High S Coal	40	9,153	$600-$3,500
				14 Coal Stoker Boilers	020101	10200204		1,645	967 E6BTU		FGD (Dry) Low S Coal	40	9,153	$700-$4,300
											FGD (Spray Dry)	90	20,594	$400-$3,920
				5 Coal Tangential Boilers	021520	10200202		16,855	2610 E6BTU		FGD (Wet) High S Coal	90	20,594	$400-$3,500
											FGD (Wet) Low S Coal	90	20,594	$500-$4,500
				2 Coal Tangential Boilers	261501	10200202		1,163	E6BTU					
5	MD	001-0011	WESTVACO FINE PAPERS				yes	19,083						
				Coal Cyclone Boiler	1	10200203		10,160			FGD (Dry) High S Coal	40	7,633	$600-$3,500
				Coal Tangential Boiler	2	10200212		8,923			FGD (Dry) Low S Coal	40	7,633	$700-$4,300
											FGD (Spray Dry)	90	17,175	$400-$3,920
											FGD (Wet) High S Coal	90	17,175	$400-$3,500
											FGD (Wet) Low S Coal	90	17,175	$500-$4,500
6	NY	4012400001	LAFARGE BUILDING MATERIALS INC				yes	14,800						
				Cement Kiln	041000	30500706		14,800						
7	WV	0002	PPG INDUSTRIES INC					12,678						
				Coal Boiler	001	10200202		3,538			FGD (Dry) High S Coal	40	5,071	$600-$3,500
				Coal Boiler	002	10200202		2,069			FGD (Dry) Low S Coal	40	5,071	$700-$4,300
				Coal Boiler	003	10200202		7,071			FGD (Spray Dry)	90	11,410	$400-$3,920
											FGD (Wet) High S Coal	90	11,410	$400-$3,500
											FGD (Wet) Low S Coal	90	11,410	$500-$4,500
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				yes	7,855						
				Coal Boiler	034	10200202		4,287	363.7 E6BTU		FGD (Dry) High S Coal	40	3,142	$800-$2,500
				Coal Boiler	035	10200202		3,568	262.3 E6BTU		FGD (Dry) Low S Coal	40	3,142	$800-$3,000
											FGD (Spray Dry)	90	7,070	$600-$2,600
											FGD (Wet) High S Coal	90	7,070	$500-$2,700
											FGD (Wet) Low S Coal	90	7,070	$700-$3,500
11	OH	1677010193	GOODYEAR TIRE & RUBBER CO.					5,903						
12	VA	00001	Stone Container Corp (d/b/a Smurfit-Stone Contain)					3,379						
				Coal Tangential Boiler	2	10200212		3,379	1056 Ton		FGD (Dry) High S Coal	40	1,352	$600-$3,500
											FGD (Dry) Low S Coal	40	1,352	$700-$4,300
											FGD (Spray Dry)	90	3,041	$400-$3,920
											FGD (Wet) High S Coal	90	3,041	$400-$3,500
											FGD (Wet) Low S Coal	90	3,041	$500-$4,500
13	NY	4192600021	ST LAWRENCE CEMENT CORP-CATSKILL QUARRY				yes	3,329						
				Cement Kiln	U00K18	30500706		3,329						
14	ME	2301900056	GREAT NORTHERN PAPER INC MILL WEST				yes	1,842						
				Residual Oil Boiler	001	10200401		1,049	370 E6BTU		FGD - Oil	90	944	$700-$7,801
				Residual Oil Boiler	002	10200401		943	370 E6BTU		FGD - Oil	90	849	$700-$7,801
				Residual Oil Boiler	003	10200401		175	370 E6BTU		FGD - Oil	90	158	$700-$7,801
				Residual Oil Boiler	004	10200401		1,842	740 E6BTU		FGD - Oil	90	1,658	$700-$7,801
				Residual Oil Boiler	005	10200401		528	592 E6BTU	99.4%				
15	DE	1000100127	NRG ENERGY CENTER DOVER LLC					1,836						
				Wall Fired Coal Boiler	001	10200219		1,836	243 E6BTU		FGD (Dry) High S Coal	40	734	$800-$2,500
											FGD (Dry) Low S Coal	40	734	$800-$3,000
											FGD (Spray Dry)	90	1,652	$600-$2,600
											FGD (Wet) High S Coal	90	1,652	$500-$2,700
											FGD (Wet) Low S Coal	90	1,652	$700-$3,500
16	ME	2302500027	SAPPI - SOMERSET				yes	1,734						
				Multi-fuel Boiler	001	10200401, 10200902, 10200903, 10200799, 10201301		2,994	848 E6BTU					
											FGD - Oil	90	2,695	
											Wet ESP - Wood (4)	80-95	2,395-2,844	
											Spray Dry w/ESP - Wood (4)	60-75	1,796-2,245	
											Spray Dry w/Fabric Filter - Wood (4)	65-80	1,946-2395	
											Dry FGD and ESP - Wood (4)	60-70	1,796-2,096	
											Dry FGD and Fabric Filter - Wood (4)	70-80	2,096-2395	
											Spray Dry, Dry FGD and Fabric Filter - Wood (4)	80-90	2,395-2,695	
											ESP and wet FGD - Wood (4)	50-95	1,497-2844	

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.