APPENDIX A

STATE LEVEL EMISSION ESTIMATES

This appendix summarizes State-level emissions by sector for each of the scenario years evaluated in this study. Tables are organized by sector, by year, and by scenario. The sectors are, in order: non-EGU point source, EGU point source, NONROAD model, onroad vehicles, and nonpoint sources.

Table A-1. Non-Electricity Generating Unit – State Emissions Summary (tons per year) Year = 1990							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	58,115	75,941	170,073	120,042	41,193	24,957	3,586
AZ	12,669	44,002	11,477	60,121	11,697	4,484	4
AR	14,534	18,901	87,202	15,646	25,935	15,232	14,965
CA	124,511	174,389	105,024	53,258	40,429	18,361	14,816
CO	23,570	41,165	22,121	14,846	25,817	11,760	238
CT	12,657	15,510	8,204	17,801	10,590	5,419	58
DE	11,615	19,324	14,838	41,436	1,164	819	653
DC	247	1,172	258	2,418	109	76	11
FL	27,052	46,643	54,336	82,298	16,776	10,957	7,348
GA	45,494	61,653	157,038	81,006	27,561	19,381	13,811
ID	718	7,504	5,005	24,725	14,632	9,165	3
IL	66,278	39,303	112,639	274,651	117,612	70,479	11,348
IN	99,399	113,747	386,096	207,967	71,189	39,603	7,600
IA	10,544	24,754	6,416	81,832	7,660	4,254	8,111
KS	44,891	104,706	66,005	36,296	36,761	15,882	12,552
KY	118,463	32,341	87,728	40,897	12,605	7,183	1,152
LA	112,605	296,856	566,206	187,839	35,857	28,004	62,336
ME	20,996	38,656	116,550	58,579	10,652	7,180	114
MD	16,347	25,554	101,720	31,548	6,157	3,165	329
MA	19,480	20,809	5,141	23,275	3,212	1,910	92
MI	136,146	106,710	123,780	243,782	42,345	26,887	456
MN	51,258	59,193	75,358	31,681	51,961	44,292	993
MS	56,358	58,961	89,457	59,698	12,209	8,731	25,021
MO	59,881	27,281	96,849	118,781	45,547	17,081	21,869
MT	9,097	16,273	44,335	48,010	17,267	9,333	402
NE	11,128	9,367	3,229	8,138	21,708	8,074	6
NV	3,902	8,277	11,398	2,400	10,162	3,458	5
NH	8,159	3,856	20,973	8,090	1,229	808	21
NJ	108,281	71,819	19,653	65,080	10,130	7,052	514
NM	11,234	69,271	19,887	101,140	7,939	5,549	33
NY	158,897	75,206	31,538	233,992	170,711	67,400	242
NC	106,792	54,591	73,468	82,568	10,632	7,882	113
ND	3,888	13,849	3,641	44,528	2,041	1,595	13
OH	132,227	84,517	668,877	359,200	39,739	26,767	2,640
OK	42,888	91,130	55,210	76,885	24,366	14,221	16,416
OR	19,307	29,030	107,429	20,970	26,793	22,418	24
PA	134,089	188,598	984,744	163,985	42,046	26,885	5,885
RI	7,130	1,268	1,672	2,808	1,310	981	8
SC	49,974	55,402	45,235	91,584	13,982	9,030	55
SD	523	3,981	262	206	1,649	861	0
TN	129,831	100,785	95,651	175,748	18,779	10,557	79
TX	268,497	509,315	363,014	475,236	101,407	51,380	2,015
UT	13,220	27,132	47,605	54,976	9,886	3,909	1,119
VT	1,083	441	347	1,050	308	259	3
VA	97,532	82,616	32,787	103,333	18,647	11,829	696
WA	24,506	32,922	237,875	47,204	12,982	9,251	4,206
WV	60,170	72,268	229,110	42,367	11,203	7,074	408
WI	43,983	37,209	89,321	133,519	29,788	18,669	839
WY	19,202	39,252	10,621	39,827	2,896	1,939	402
National	**2,609,368**	**3,133,450**	**5,667,404**	**4,293,268**	**1,277,270**	**722,442**	**243,615**

Table A-2. Non-Electricity Generating Unit without CAAA Scenario – State Emissions Summary (tons per year) Year = 2000							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	68,257	87,742	189,332	163,272	51,305	30,375	2,853
AZ	21,206	63,809	17,234	67,539	14,128	5,508	4
AR	18,991	21,968	101,422	20,291	33,118	18,449	16,929
CA	144,740	203,482	110,730	42,155	48,433	21,796	13,453
CO	39,402	65,302	34,796	17,429	32,953	15,090	336
CT	15,057	13,993	9,136	9,644	10,714	5,591	19
DE	13,888	22,913	14,660	46,152	1,428	1,025	703
DC	284	1,658	423	5,060	195	140	5
FL	28,987	45,511	59,431	79,397	17,726	11,821	5,647
GA	57,463	60,710	169,462	71,358	29,334	20,837	10,569
ID	858	8,746	6,942	36,448	18,612	11,802	2
IL	75,811	40,942	131,644	272,816	137,174	84,143	12,123
IN	120,826	124,412	486,065	210,336	82,358	47,088	8,417
IA	13,775	27,329	7,881	100,234	9,040	4,966	6,645
KS	51,112	93,497	88,518	38,119	41,059	16,810	10,399
KY	141,461	37,459	117,898	45,396	14,068	8,079	2,055
LA	133,451	301,084	665,744	228,933	41,566	31,940	71,516
ME	22,074	37,844	122,832	60,711	10,859	7,348	126
MD	20,035	25,254	129,724	26,286	6,812	3,613	386
MA	23,231	20,142	5,274	13,564	2,984	1,787	56
MI	182,417	107,465	144,158	258,922	50,551	32,074	483
MN	63,562	70,189	85,635	35,462	61,336	52,571	1,032
MS	67,413	53,234	89,543	52,663	13,744	9,844	17,094
MO	72,703	30,998	105,769	142,831	53,589	20,043	17,899
MT	9,129	20,581	50,421	48,476	21,853	11,531	371
NE	13,075	13,322	3,643	9,894	23,177	8,632	11
NV	5,557	11,385	12,681	3,413	14,535	4,949	6
NH	9,126	4,050	19,824	7,556	1,139	776	21
NJ	110,506	63,087	18,247	21,723	4,090	3,267	220
NM	12,094	89,689	25,590	126,622	9,023	6,087	34
NY	171,817	67,388	40,288	201,587	185,721	72,253	165
NC	132,906	49,796	80,856	67,087	11,237	8,769	104
ND	6,225	22,268	5,456	59,450	1,618	1,078	5
OH	159,722	74,955	798,898	179,389	38,682	26,754	3,021
OK	41,910	75,682	52,063	84,729	29,510	16,538	18,253
OR	22,633	36,965	124,625	19,431	36,196	31,407	25
PA	138,599	171,352	1,014,840	140,227	45,175	28,905	3,851
RI	5,994	1,269	1,879	1,898	1,374	1,034	6
SC	60,585	57,383	50,006	87,952	13,733	9,407	57
SD	688	4,718	286	109	1,911	1,026	1
TN	149,778	101,723	97,095	153,087	19,822	11,254	76
TX	334,252	586,487	436,375	564,284	124,204	62,449	2,233
UT	17,298	35,342	66,190	62,138	14,181	5,230	1,426
VT	1,344	640	399	1,858	395	321	5
VA	112,206	79,509	35,546	89,396	20,747	13,470	845
WA	28,599	33,362	225,427	43,978	12,398	8,717	3,700
WV	68,671	68,180	239,136	33,461	14,104	8,995	495
WI	54,658	52,507	157,429	150,518	32,927	20,535	2,019
WY	19,613	41,208	15,431	58,459	3,348	2,199	429
National	**3,083,990**	**3,328,534**	**6,466,885**	**4,261,741**	**1,464,183**	**828,322**	**236,126**

Table A-3. Non-Electricity Generating Unit with CAAA Scenario – State Emissions Summary (tons per year) Year = 2000							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	47,412	82,947	174,506	97,496	15,548	12,742	2,245
AZ	4,629	813	9,007	22,012	958	1,094	67
AR	37,208	449	55,178	21,792	122	122	1,256
CA	54,603	95,094	99,462	41,500	9,485	8,653	749,767
CO	90,704	41,753	28,350	7,600	18,965	18,965	86
CT	4,654	6,952	2,284	2,327	940	940	91
DE	4,648	6,354	9,055	40,648	1,770	1,732	153
DC	68	302	231	223	59	58	4
FL	38,485	45,029	81,918	65,555	10,485	10,485	3,028
GA	33,123	50,980	130,759	61,102	20,829	19,450	4,571
ID	2,389	13,878	24,505	17,606	2,604	1,869	1,074
IL	53,570	61,352	47,536	78,735	19,853	20,090	1,206
IN	55,895	78,406	364,122	97,284	26,854	15,840	3,229
IA	37,861	38,472	36,292	37,093	13,263	11,685	4,627
KS	26,477	71,227	75,084	10,819	3,632	3,215	60,091
KY	44,876	38,395	109,971	34,473	5,980	5,980	836
LA	78,361	197,990	126,312	172,834	23,358	18,719	7,851
ME	8,365	26,099	12,508	20,633	9,242	7,910	1,008
MD	5,751	21,917	94,343	34,275	88	88	222
MA	7,669	16,339	10,009	14,116	1,220	461	419
MI	39,680	78,917	65,280	59,592	15,039	13,480	990
MN	28,661	68,283	29,287	26,602	23,216	21,815	27,118
MS	43,180	60,174	54,482	36,517	19,297	9,916	1,510
MO	34,686	36,188	107,859	95,727	14,582	14,582	30,993
MT	6,827	16,566	29,500	13,272	6,226	6,226	265
NE	6,596	16,744	5,817	17,376	3,991	3,726	1,006
NV	1,596	10,150	7,501	1,314	1,855	1,855	234
NH	1,467	1,727	967	2,559	322	260	56
NJ	13,274	16,758	7,772	9,942	2,294	2,294	492
NM	24,109	72,603	41,352	44,918	20,486	20,486	61
NY	6,298	40,765	55,526	58,281	4,836	4,458	1,244
NC	72,711	45,235	50,573	46,830	13,570	11,943	1,658
ND	1,249	9,926	5,777	15,448	2,135	2,135	139
OH	29,541	65,229	237,968	101,517	14,936	11,431	6,532
OK	35,123	79,639	51,130	55,371	9,359	7,194	3,118
OR	27,650	14,752	33,992	5,245	9,892	9,892	787
PA	36,157	87,534	104,119	87,991	20,539	14,665	1,337
RI	1,463	1,537	1,035	1,804	305	305	47
SC	38,457	42,145	56,315	54,370	8,450	7,078	1,650
SD	2,430	4,765	4,070	1,480	767	767	50
TN	78,905	70,884	117,743	87,994	32,958	28,387	2,323
TX	149,573	327,914	284,414	244,321	42,503	36,118	2,297
UT	5,881	15,774	45,306	10,314	7,984	3,790	529
VT	1,077	354	213	875	127	127	16
VA	43,156	59,867	63,799	64,677	13,467	12,395	3,500
WA	12,475	24,494	38,043	24,192	5,974	3,776	826
WV	14,603	46,661	89,876	54,104	6,259	5,354	689
WI	31,018	38,145	34,013	64,493	8,206	8,082	398
WY	16,749	29,666	23,110	33,675	3,802	2,451	301
National	**1,441,342**	**2,278,144**	**3,138,265**	**2,198,926**	**498,632**	**425,087**	**931,996**

Table A-4. Non-Electricity Generating Unit without CAAA Scenario – State Emissions Summary (tons per year) Year = 2010							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	70,180	85,883	198,579	173,598	53,162	31,636	3,321
AZ	26,145	72,679	20,524	69,192	17,272	6,757	4
AR	20,935	25,805	113,299	24,984	39,368	21,938	15,011
CA	173,665	211,260	125,174	54,057	54,643	24,435	15,622
CO	50,325	61,251	36,859	20,381	40,103	18,389	387
CT	16,965	17,469	10,541	15,253	12,209	6,512	41
DE	16,770	26,837	16,116	52,759	2,054	1,470	916
DC	279	1,949	488	5,677	217	154	5
FL	32,927	50,186	63,355	98,098	19,728	13,223	6,107
GA	75,267	80,629	222,347	91,745	41,608	30,296	11,383
ID	1,012	9,876	9,752	43,589	21,520	14,629	8
IL	83,336	41,413	127,780	298,678	148,721	90,124	12,136
IN	129,472	121,703	464,278	210,481	86,291	48,691	8,187
IA	14,794	29,464	8,748	109,171	10,322	5,652	6,871
KS	57,526	89,340	102,862	44,612	47,109	17,950	10,783
KY	173,267	56,429	199,651	55,864	18,474	11,186	2,377
LA	138,627	306,866	686,692	250,422	48,266	36,814	65,843
ME	21,239	49,712	133,449	95,224	13,449	9,013	217
MD	22,779	29,756	144,777	32,353	7,813	4,166	427
MA	25,329	28,476	6,677	32,292	4,216	2,657	127
MI	197,879	109,740	149,633	274,339	51,526	32,955	493
MN	75,215	73,587	99,292	42,424	69,762	60,378	1,218
MS	77,492	53,569	87,470	58,277	11,228	7,859	20,423
MO	77,384	35,231	102,893	165,934	56,353	21,218	18,512
MT	11,531	24,048	57,343	52,203	26,902	14,410	441
NE	14,197	14,052	3,972	12,523	23,765	8,896	11
NV	6,789	13,743	12,624	3,820	18,134	6,156	8
NH	8,979	5,666	16,258	17,172	1,707	1,154	42
NJ	132,350	68,409	20,569	25,414	4,552	3,587	256
NM	13,032	99,674	28,689	143,653	9,854	6,487	37
NY	192,812	70,056	42,883	209,257	221,827	81,350	149
NC	145,891	55,807	90,364	83,606	13,493	10,569	155
ND	8,018	23,164	6,217	59,292	1,356	907	6
OH	171,330	72,188	774,538	150,617	38,826	26,645	3,188
OK	58,215	82,949	54,929	100,605	35,126	20,005	16,483
OR	29,210	53,892	156,934	26,238	51,926	46,799	38
PA	149,254	173,143	1,053,419	147,539	48,431	30,683	4,069
RI	6,211	1,462	1,879	2,480	1,518	1,168	7
SC	70,231	63,194	55,502	107,223	15,942	11,029	75
SD	822	6,150	483	719	2,151	1,160	2
TN	163,936	105,265	101,117	168,884	22,183	12,829	81
TX	366,216	616,697	445,544	625,457	146,971	71,698	2,279
UT	19,710	39,318	73,421	69,395	16,920	6,138	1,595
VT	1,407	693	268	2,782	405	312	7
VA	131,568	86,234	41,377	98,798	24,009	15,672	925
WA	34,921	36,327	171,623	41,004	11,693	8,350	3,788
WV	80,889	65,693	264,222	37,132	15,661	9,999	534
WI	59,500	56,239	176,661	151,559	35,494	22,594	2,291
WY	24,464	51,546	26,240	104,482	4,143	2,755	572
National	**3,480,293**	**3,554,720**	**6,808,311**	**4,761,255**	**1,668,399**	**939,451**	**237,459**

Table A-5. Non-Electricity Generating Unit with CAAA Scenario – State Emissions Summary (tons per year) Year = 2010							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	50,403	72,729	189,281	110,546	16,197	13,405	2,581
AZ	4,866	858	11,218	23,524	694	1,286	88
AR	38,772	580	39,181	18,090	149	149	1,558
CA	59,440	104,669	113,682	47,593	10,786	9,804	865,556
CO	112,252	41,538	30,798	8,585	14,136	14,136	136
CT	2,423	6,217	2,468	2,069	339	1,055	116
DE	4,641	3,305	10,089	13,691	1,692	1,692	174
DC	79	133	250	248	64	63	4
FL	44,462	48,938	96,331	72,915	11,084	11,084	3,427
GA	40,822	57,421	145,515	67,297	22,946	21,444	5,640
ID	1,913	15,333	29,990	19,407	2,673	2,026	1,236
IL	46,616	57,920	50,977	76,510	17,813	17,813	1,358
IN	55,134	73,231	298,739	95,887	19,234	12,620	3,501
IA	38,388	42,582	41,286	43,911	15,221	13,470	5,152
KS	28,834	75,826	92,655	12,950	4,175	3,658	64,484
KY	41,747	36,238	108,798	30,402	6,245	6,245	1,024
LA	87,064	179,565	140,889	191,778	26,410	21,160	8,875
ME	9,090	24,942	14,255	21,746	10,722	9,212	1,175
MD	5,203	17,486	107,455	36,312	105	105	249
MA	8,157	13,570	10,843	15,408	1,337	504	466
MI	34,668	81,284	67,525	66,824	11,806	11,806	1,121
MN	29,082	76,126	31,172	26,672	14,170	14,170	31,949
MS	44,719	47,095	60,457	37,826	18,939	9,300	1,098
MO	36,666	42,950	119,258	121,210	16,391	16,391	36,374
MT	7,532	19,170	33,423	15,822	6,535	6,535	324
NE	7,745	20,984	7,051	23,361	4,570	4,205	1,318
NV	1,797	12,194	8,791	1,583	1,700	1,700	327
NH	1,480	1,385	1,060	2,794	357	288	69
NJ	13,365	16,079	8,524	9,432	2,622	2,622	618
NM	26,202	73,687	45,990	50,109	32,227	32,227	82
NY	5,237	30,641	55,859	60,992	4,727	4,727	1,345
NC	72,912	39,338	59,006	46,778	11,431	11,431	2,035
ND	1,222	9,715	6,374	17,415	2,353	2,353	178
OH	22,396	58,668	206,752	71,302	8,869	8,538	7,028
OK	39,591	77,881	56,040	61,615	10,975	8,394	3,605
OR	24,827	17,045	39,499	5,906	10,868	10,868	1,035
PA	33,521	76,708	115,355	88,370	17,543	16,436	1,511
RI	1,401	1,090	1,157	1,962	329	329	64
SC	38,778	43,284	64,737	58,459	8,423	7,219	2,058
SD	2,147	6,029	4,874	1,814	895	895	65
TN	69,349	58,484	126,174	85,426	33,321	28,929	2,518
TX	161,931	299,092	327,896	250,818	48,907	41,372	3,155
UT	7,096	17,387	57,961	10,837	9,446	4,476	667
VT	1,221	242	242	952	142	142	24
VA	48,298	58,329	75,440	72,489	14,660	13,742	4,968
WA	13,760	26,138	39,425	23,216	4,292	3,961	1,011
WV	15,137	38,709	109,138	60,400	6,872	5,932	855
WI	31,525	38,951	39,284	62,114	9,061	8,945	467
WY	20,084	29,666	27,579	36,276	3,801	2,451	368
National	**1,493,995**	**2,191,430**	**3,330,740**	**2,281,643**	**498,256**	**441,316**	**1,073,038**

Table A-6. Non-Electricity Generating Unit without CAAA Scenario – State Emissions Summary (tons per year) Year = 2020							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	74,474	94,370	200,861	177,344	58,543	35,051	3,387
AZ	33,833	85,256	26,333	80,781	21,048	8,564	4
AR	25,838	30,552	133,652	30,103	48,673	26,947	16,966
CA	218,612	226,895	141,377	55,786	62,902	27,938	16,671
CO	66,448	71,360	40,202	23,367	48,468	22,136	443
CT	19,774	19,964	12,823	16,315	13,848	7,609	40
DE	19,903	29,639	16,881	57,695	2,311	1,665	1,046
DC	301	2,121	546	6,158	244	177	7
FL	38,906	56,093	71,697	106,334	22,406	15,117	5,883
GA	87,633	89,462	251,979	102,338	47,424	34,648	10,960
ID	1,250	11,470	14,015	55,776	26,889	19,104	9
IL	95,474	44,781	133,605	323,784	164,037	99,593	13,371
IN	145,278	125,353	466,185	211,087	91,101	51,412	8,730
IA	16,992	30,237	9,389	109,217	11,281	6,210	7,028
KS	66,937	97,428	109,856	49,358	52,241	19,685	11,145
KY	196,951	61,943	219,350	60,051	19,669	11,954	2,701
LA	163,700	421,954	851,218	337,167	65,419	49,722	75,360
ME	21,761	49,445	135,162	92,681	13,688	9,182	209
MD	27,086	33,543	157,953	35,159	8,801	4,737	464
MA	29,266	33,343	8,018	33,642	4,763	2,997	127
MI	228,500	118,451	164,123	296,828	54,490	35,082	558
MN	87,146	79,922	112,205	47,303	75,736	65,437	1,366
MS	89,897	55,756	90,719	61,286	12,257	8,561	19,581
MO	88,073	38,471	111,435	193,621	61,848	23,516	18,928
MT	13,908	29,195	64,944	61,677	32,369	17,381	505
NE	15,947	15,172	4,130	13,538	25,499	9,618	12
NV	8,560	16,228	14,748	4,640	22,187	7,537	9
NH	10,336	5,736	17,454	16,578	1,704	1,156	42
NJ	156,249	77,959	23,266	26,805	4,886	3,865	274
NM	14,684	116,263	33,948	169,389	11,046	7,103	42
NY	215,749	74,796	51,834	213,495	243,549	90,199	152
NC	168,184	65,382	104,814	91,908	15,983	12,663	172
ND	8,793	25,064	6,686	64,910	1,524	1,040	6
OH	191,339	78,195	790,367	141,174	41,919	28,857	3,443
OK	75,696	95,862	62,614	111,438	42,425	24,335	18,588
OR	35,195	60,935	182,259	19,260	61,094	55,378	25
PA	163,475	184,134	1,057,544	153,378	52,983	33,532	3,872
RI	6,934	1,595	1,752	2,553	1,540	1,222	7
SC	83,694	72,031	63,851	116,073	17,831	12,636	82
SD	979	6,807	520	716	2,316	1,255	2
TN	181,955	112,709	105,048	176,662	24,328	14,257	92
TX	421,399	678,128	511,857	719,333	169,478	83,063	2,697
UT	23,350	45,045	75,838	74,774	20,144	7,437	1,739
VT	1,681	694	290	2,678	406	315	6
VA	155,547	100,393	48,922	107,131	27,436	17,945	1,023
WA	42,383	40,256	169,945	40,360	12,815	9,241	4,019
WV	94,257	70,390	279,734	41,051	17,092	10,933	579
WI	67,464	57,757	199,396	157,058	38,540	24,694	2,619
WY	27,442	58,237	30,417	120,173	4,730	3,140	647
National	**4,029,231**	**3,996,770**	**7,381,762**	**5,209,932**	**1,881,910**	**1,065,848**	**255,636**

Table A-7. Non-Electricity Generating Unit with CAAA Scenario – State Emissions Summary (tons per year) Year = 2020							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	54,777	79,580	198,022	116,515	17,338	14,355	2,798
AZ	7,552	998	12,955	28,888	1,378	1,378	129
AR	47,111	757	46,381	19,944	185	185	1,999
CA	72,703	119,547	130,681	54,570	12,354	11,217	1,034,122
CO	135,316	48,227	34,315	9,693	27,401	27,367	215
CT	2,675	7,377	2,794	2,276	375	375	145
DE	5,688	3,600	10,986	14,766	1,864	1,864	214
DC	88	149	279	280	71	70	5
FL	52,739	54,701	108,655	77,070	12,595	12,595	3,806
GA	49,247	63,711	164,496	72,167	26,210	24,592	6,955
ID	2,378	18,760	38,831	28,436	4,035	2,966	1,837
IL	52,757	60,406	53,454	75,676	19,181	19,181	1,525
IN	62,403	77,596	307,260	97,747	20,031	13,242	3,829
IA	43,692	45,167	44,664	46,801	17,116	15,244	5,663
KS	32,501	81,960	112,455	14,529	4,678	4,096	70,063
KY	45,070	39,335	117,499	32,068	6,934	6,934	1,206
LA	98,902	198,174	159,435	231,819	30,578	24,461	10,219
ME	9,682	26,583	15,334	23,173	11,461	9,850	1,253
MD	6,176	19,506	117,300	38,158	132	132	276
MA	9,428	16,288	12,240	16,560	1,467	546	520
MI	39,844	86,503	72,333	68,564	12,604	12,604	1,231
MN	33,501	81,838	33,917	28,599	15,820	15,820	37,789
MS	49,911	50,926	63,959	37,114	20,738	10,180	1,232
MO	42,068	47,712	131,790	140,365	18,249	18,249	43,535
MT	8,844	22,456	38,781	19,094	8,376	8,376	389
NE	8,961	25,251	8,072	29,631	5,251	4,766	1,704
NV	2,221	14,256	10,286	1,832	2,639	2,574	473
NH	1,775	1,617	1,143	2,998	388	314	81
NJ	16,177	19,242	9,700	11,173	3,089	3,089	763
NM	30,213	82,295	51,939	58,627	49,910	49,910	114
NY	5,721	33,791	58,362	61,114	5,096	5,096	1,406
NC	81,083	44,186	68,833	51,276	13,075	13,075	2,456
ND	1,326	10,193	6,853	18,856	2,557	2,557	226
OH	24,893	61,884	208,407	70,015	9,590	9,217	8,079
OK	45,725	84,080	61,285	67,856	12,942	9,864	4,245
OR	24,616	19,360	44,646	6,476	11,690	11,690	1,394
PA	36,380	82,045	126,297	90,372	19,344	18,071	1,723
RI	1,655	1,221	1,412	2,101	355	355	88
SC	45,108	48,374	72,925	63,073	9,526	8,191	2,567
SD	2,393	6,742	5,307	2,056	974	974	85
TN	73,766	62,231	133,237	85,959	36,737	32,029	2,635
TX	186,116	335,793	388,269	277,800	57,991	49,012	4,393
UT	9,077	19,368	66,464	11,864	11,176	5,280	876
VT	1,455	263	266	1,011	154	154	32
VA	55,525	70,553	86,152	83,179	16,968	15,858	7,253
WA	16,209	30,842	41,975	26,526	7,829	4,853	1,256
WV	18,526	43,451	157,002	70,792	7,554	6,513	1,110
WI	35,708	39,593	43,137	57,397	9,844	9,741	534
WY	24,720	29,666	32,553	43,433	3,801	2,451	445
National	**1,714,402**	**2,418,153**	**3,713,336**	**2,490,285**	**589,651**	**521,514**	**1,274,891**

Table A-8. Electricity Generating Unit – State Emissions Summary (tons per year) Year = 1990							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	774	187,320	6,681	528,639			
AZ	562	72,730	4,967	119,900			
AR	443	39,524	4,205	69,160			
CA	587	110,602	9,419	7,796			
CO	562	88,848	4,822	86,983			
CT	463	22,669	1,873	53,014			
DE	139	23,726	1,009	46,990			
DC	24	704	84	2,524			
FL	2,148	285,786	14,472	645,930			
GA	981	228,804	8,411	875,451			
ID	0	0	0	0			
IL	1,023	259,728	8,640	899,210			
IN	1,741	421,755	15,011	1,511,021			
IA	544	78,309	4,798	180,529			
KS	552	69,370	5,029	87,679			
KY	1,079	345,009	9,259	905,632			
LA	643	85,773	8,804	98,711			
ME	106	3,701	368	11,502			
MD	514	117,577	3,652	282,451			
MA	878	92,286	4,652	232,286			
MI	1,085	205,587	9,324	375,772			
MN	606	83,138	5,346	84,413			
MS	218	48,511	2,348	119,115			
MO	852	193,776	7,407	787,810			
MT	330	31,554	2,836	17,922			
NE	284	32,958	2,472	50,534			
NV	288	48,790	2,684	55,779			
NH	150	30,242	776	68,508			
NJ	258	65,840	2,010	77,149			
NM	552	95,191	5,044	64,104			
NY	2,264	174,121	14,796	416,770			
NC	633	204,850	5,433	336,450			
ND	756	100,553	6,575	124,611			
OH	1,710	534,056	14,664	2,241,092			
OK	644	89,904	7,294	101,852			
OR	30	2,837	256	4,936			
PA	1,619	425,200	13,076	1,213,386			
RI	15	1,966	144	1,092			
SC	325	96,471	2,861	167,416			
SD	82	19,148	707	31,188			
TN	726	236,504	6,230	796,526			
TX	3,871	452,176	45,164	462,390			
UT	476	71,108	4,084	32,051			
VT	1	189	14	0			
VA	333	84,042	2,650	158,626			
WA	171	16,915	1,468	58,741			
WV	1,052	335,023	9,030	968,612			
WI	640	96,248	5,769	284,855			
WY	828	99,413	7,099	84,596			
National	**34,558**	**6,410,533**	**303,713**	**15,831,702**			

Table A-9. Electricity Generating Unit without CAAA Scenario– State Emissions Summary (tons per year)

Year = 2000

State	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$	NH_3
AL	1,082	285,989	9,741	630,303	29,110	24,772	10
AZ	704	92,835	10,518	133,498	9,436	7,327	43
AR	380	36,207	3,519	66,560	2,395	1,992	7
CA	2,334	35,806	47,309	11,645	4,990	4,891	1,030
CO	566	108,420	8,968	115,149	3,775	3,254	5
CT	206	23,136	10,356	20,702	956	818	45
DE	50	13,853	569	23,540	3,455	2,243	0
FL	1,760	282,948	37,009	631,197	26,147	19,905	311
GA	1,180	286,129	10,744	958,571	36,389	30,432	11
ID	39	1,325	1,503	0	121	121	0
IL	1,816	384,869	12,291	1,339,726	19,408	17,844	12
IN	1,906	521,180	14,995	1,702,996	54,984	44,945	17
IA	527	92,678	4,445	172,075	5,088	4,173	5
KS	669	89,149	5,186	77,738	5,938	4,846	6
KY	1,454	462,826	13,903	1,208,741	32,019	25,216	12
LA	526	50,385	5,743	118,952	3,145	2,742	8
ME	138	8,620	5,739	3,846	398	386	41
MD	445	141,201	7,514	339,857	23,314	21,805	4
MA	621	75,803	9,358	145,928	4,925	4,182	306
MI	1,431	268,463	13,207	465,965	27,521	22,279	13
MN	639	97,511	4,885	91,076	16,190	11,772	5
MS	212	42,642	2,944	122,410	3,511	2,774	2
MO	1,489	304,162	10,948	829,941	26,494	24,581	11
MT	312	37,501	2,592	19,089	7,470	4,706	3
NE	422	55,502	3,337	69,787	2,386	1,964	4
NV	359	55,879	5,630	78,938	4,552	3,667	6
NH	94	35,916	505	55,914	2,723	2,610	1
NJ	198	69,604	3,231	76,133	5,151	4,784	1
NM	444	83,722	4,239	38,112	9,381	6,375	11
NY	995	122,626	22,561	240,724	17,368	15,997	208
NC	1,027	349,310	9,936	548,470	32,110	26,740	10
ND	775	103,589	6,607	195,658	7,759	6,582	6
OH	1,845	662,269	15,469	2,765,359	85,106	75,429	17
OK	826	97,213	19,598	130,210	12,019	10,998	40
OR	189	11,370	5,467	9,857	855	769	1
PA	1,579	489,249	14,017	1,182,237	72,426	65,083	15
RI	38	957	1,500	0	121	121	0
SC	473	147,052	4,098	222,945	19,948	15,781	4
SD	100	20,955	476	33,828	198	187	1
TN	880	317,476	7,096	741,802	21,040	19,107	8
TX	5,467	433,124	77,675	633,659	36,154	27,406	941
UT	404	73,848	3,378	35,157	5,311	4,145	4
VT	0	22	8	0	1	1	0
VA	463	130,483	7,142	224,072	13,710	11,955	4
WA	286	27,950	5,498	68,012	3,086	2,549	2
WV	1,393	463,927	12,262	1,202,946	36,334	29,577	13
WI	837	133,093	7,221	285,118	8,352	7,395	7
WY	659	105,227	5,493	78,218	8,428	7,059	6
National	40,238	7,734,001	496,430	18,146,659	751,696	634,287	3,217

Table A-10. Electricity Generating Unit with CAAA Scenario– State Emissions Summary (tons per year)

Year = 2000

State	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$	NH_3
AL	1,086	167,467	9,818	559,925	28,433	24,157	11
AZ	750	79,291	10,988	47,637	9,880	7,572	33
AR	493	40,659	4,435	77,159	3,123	2,596	8
CA	2,287	38,875	46,221	3,901	4,897	4,798	1,012
CO	577	67,880	9,121	111,530	3,791	3,257	5
CT	211	10,634	10,518	15,227	969	831	45
DE	84	10,006	863	13,531	6,628	3,833	1
FL	1,774	190,751	37,522	200,700	25,320	19,426	316
GA	1,124	150,203	10,294	573,241	34,192	28,639	11
ID	39	1,326	1,504	0	121	121	0
IL	2,125	196,082	14,120	362,667	19,405	17,564	15
IN	1,925	287,651	14,971	852,132	49,146	39,481	16
IA	598	63,741	5,156	119,119	5,698	4,598	5
KS	757	82,366	5,845	77,691	6,550	5,402	6
KY	1,465	223,728	13,521	572,876	31,060	24,434	12
LA	537	49,567	5,847	97,429	3,218	2,803	8
ME	158	5,360	6,243	5,244	441	428	47
MD	361	66,743	4,625	226,687	19,439	18,156	3
MA	515	37,214	8,973	91,182	4,619	3,885	179
MI	1,369	157,983	13,024	386,754	26,721	21,746	13
MN	678	80,031	5,235	107,507	18,723	13,599	6
MS	247	31,558	3,991	91,061	3,765	2,975	2
MO	1,702	169,687	12,403	303,764	27,668	25,623	13
MT	309	37,261	2,572	19,037	7,370	4,611	3
NE	404	45,775	3,257	69,023	2,385	1,962	4
NV	366	45,915	5,699	73,684	4,582	3,689	6
NH	94	7,187	513	50,452	2,724	2,610	1
NJ	182	21,004	2,993	62,031	4,636	4,304	1
NM	512	72,511	4,485	51,880	11,225	7,773	12
NY	1,052	77,205	23,603	212,391	16,713	15,495	265
NC	982	163,709	10,148	526,767	30,619	25,537	9
ND	684	60,402	5,786	168,298	7,030	5,984	6
OH	1,823	399,799	15,243	1,186,050	79,233	69,465	17
OK	830	79,504	19,636	121,139	12,022	11,002	43
OR	189	11,808	5,502	9,857	857	772	1
PA	1,456	208,104	12,983	752,903	63,813	57,141	14
RI	64	1,894	2,515	0	203	203	0
SC	494	58,675	4,282	242,458	19,725	15,644	5
SD	100	13,309	476	11,124	198	187	1
TN	840	142,893	6,784	392,933	19,720	17,812	7
TX	5,509	225,543	78,300	631,100	36,212	27,464	966
UT	405	58,385	3,387	50,167	5,257	4,106	4
VT	1	81	30	0	2	2	0
VA	475	78,514	8,307	228,372	13,713	11,989	4
WA	287	26,840	5,556	32,141	3,090	2,554	2
WV	1,387	282,518	12,198	773,366	36,370	29,678	12
WI	844	87,079	7,721	175,768	8,295	7,342	7
WY	731	79,262	6,092	81,492	8,915	7,386	7
National	40,882	4,493,981	503,306	10,819,399	728,719	610,638	3,162

Table A-11. Electricity Generating Unit without CAAA Scenario – State Emissions Summary (tons per year)

Year = 2010

State	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$	NH_3
AL	1,318	309,096	16,736	639,259	31,626	26,968	11
AZ	1,079	100,463	23,443	140,076	12,545	10,119	6
AR	547	50,011	5,898	80,856	3,373	2,821	7
CA	919	40,900	34,090	11,855	3,630	3,530	0
CO	626	110,037	10,200	111,190	3,956	3,386	5
CT	127	17,257	9,167	24,789	874	733	1
DE	74	17,421	1,163	29,329	4,455	2,891	1
DC	1	35	26	0	2	2	0
FL	1,736	271,397	45,668	632,270	27,585	21,168	55
GA	1,618	324,165	20,157	1,023,606	41,947	34,840	13
ID	30	1,127	1,156	0	93	93	0
IL	1,987	407,191	13,732	1,373,192	22,487	20,681	14
IN	2,298	577,475	19,565	1,788,603	61,526	49,633	19
IA	793	132,318	7,164	194,550	10,084	8,601	7
KS	801	108,866	6,135	86,136	7,057	5,827	7
KY	1,595	501,568	16,090	1,267,681	36,224	28,763	13
LA	656	53,419	10,246	124,416	3,621	3,198	8
ME	48	3,100	3,907	3,915	237	224	0
MD	487	152,399	9,863	366,995	24,719	23,062	4
MA	486	76,033	11,858	109,912	4,854	4,108	68
MI	1,526	281,407	14,937	473,113	28,771	23,380	14
MN	745	113,265	5,830	104,812	19,909	14,471	6
MS	315	61,040	4,592	148,220	4,794	3,792	2
MO	1,707	325,717	12,667	680,220	28,811	26,644	13
MT	324	38,525	2,912	19,626	7,664	4,856	3
NE	443	58,393	3,523	71,175	2,489	2,051	4
NV	449	60,683	8,492	80,181	4,961	4,032	3
NH	168	37,254	3,343	56,920	3,001	2,885	1
NJ	305	96,715	6,076	95,535	6,772	6,252	2
NM	434	84,207	3,765	38,798	9,505	6,444	7
NY	753	108,902	21,006	237,181	17,547	16,152	11
NC	1,355	441,741	13,952	715,840	41,810	34,898	13
ND	788	105,282	6,718	199,124	7,900	6,704	6
OH	2,056	710,797	18,438	2,927,691	92,997	82,488	19
OK	993	98,127	26,376	132,823	12,751	11,712	29
OR	257	13,616	8,098	10,034	1,074	987	1
PA	1,844	534,178	19,179	1,196,541	77,856	69,999	16
RI	46	719	1,777	0	143	143	0
SC	637	170,949	7,782	252,155	22,379	17,781	5
SD	109	22,912	507	37,069	215	203	1
TN	897	325,241	6,979	763,241	21,799	19,819	8
TX	5,312	396,096	84,536	644,463	37,131	28,225	582
UT	423	77,368	3,523	36,439	5,593	4,360	4
VT	0	14	5	0	0	0	0
VA	640	156,970	12,497	270,511	17,211	15,117	5
WA	389	32,435	9,451	69,321	3,452	2,906	2
WV	1,452	484,112	12,705	1,245,710	38,406	31,352	13
WI	981	149,874	9,795	263,824	9,645	8,541	8
WY	759	108,662	6,325	88,335	9,171	7,599	7
National	43,333	8,349,482	602,048	18,867,532	834,655	704,443	1,023

Table A-12. Electricity Generating Unit with CAAA Scenario – State Emission Summary (tons per year) Year = 2010							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	1,272	56,820	16,392	375,192	24,201	19,817	10
AZ	1,090	79,996	23,237	54,118	12,760	10,197	6
AR	676	31,930	10,632	82,416	3,811	3,248	7
CA	903	18,286	33,461	5,066	3,582	3,480	0
CO	634	69,070	10,490	91,838	3,980	3,410	5
CT	124	7,677	9,030	3,901	833	692	1
DE	111	9,048	1,341	45,132	8,147	4,706	1
DC	1	35	26	0	2	2	0
FL	1,691	63,182	45,776	167,154	25,699	19,283	9
GA	1,599	105,971	19,926	432,798	33,474	26,614	13
ID	30	663	1,171	0	95	95	0
IL	2,239	68,194	15,279	235,022	16,774	14,735	16
IN	2,181	107,958	19,110	332,276	43,181	32,571	18
IA	774	53,987	7,014	163,573	9,926	8,482	7
KS	816	90,207	6,221	80,071	7,152	5,917	7
KY	1,597	98,224	16,364	351,277	33,053	25,683	13
LA	632	35,540	9,276	99,182	3,543	3,120	8
ME	47	1,803	3,859	5,338	233	220	0
MD	481	14,066	8,074	55,567	8,427	6,811	4
MA	469	19,748	12,744	17,391	3,639	2,901	16
MI	1,505	92,145	14,882	392,452	28,269	22,968	14
MN	675	39,527	5,587	93,709	19,318	14,181	6
MS	341	31,166	5,589	85,626	4,874	3,872	3
MO	1,749	70,545	12,876	269,140	29,045	26,858	13
MT	322	38,465	2,897	22,474	7,650	4,845	3
NE	446	49,378	3,544	72,333	2,496	2,057	4
NV	434	46,373	8,206	30,825	4,886	3,973	3
NH	163	2,774	3,306	7,289	981	883	1
NJ	315	12,831	6,257	49,719	6,712	6,163	2
NM	514	73,563	4,436	52,884	11,416	7,901	8
NY	720	40,031	21,116	101,188	14,800	13,509	3
NC	1,291	59,705	13,356	266,539	29,422	22,792	12
ND	758	68,364	9,711	112,044	7,142	6,050	6
OH	2,114	100,281	20,678	326,054	47,224	36,354	19
OK	998	78,986	26,488	117,565	12,760	11,721	31
OR	259	11,035	8,181	10,034	1,081	994	1
PA	1,746	94,885	19,066	266,829	42,199	34,864	15
RI	44	648	1,719	0	139	139	0
SC	615	37,735	7,310	175,823	20,128	15,647	5
SD	109	14,541	507	12,085	215	203	1
TN	801	38,699	6,186	230,590	16,215	14,355	7
TX	4,900	167,291	93,158	399,621	37,078	28,279	488
UT	422	60,744	3,519	52,915	5,574	4,345	4
VT	0	14	5	0	0	0	0
VA	606	46,162	12,458	147,139	13,656	11,753	5
WA	390	25,802	9,463	12,236	3,453	2,907	2
WV	1,419	65,827	12,434	222,575	30,677	23,814	13
WI	966	56,126	9,855	161,474	9,579	8,507	8
WY	678	81,171	5,647	76,985	8,652	7,244	6
National	42,664	2,437,219	617,860	6,365,458	658,151	529,163	822

Table A-13. Electricity Generating Unit without CAAA Scenario – State Emission Summary (tons per year)

Year = 2020

State	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$	NH_3
AL	1,533	321,642	24,778	629,253	32,492	27,795	13
AZ	1,285	109,398	30,704	136,580	13,383	10,813	6
AR	637	52,989	9,132	82,416	3,690	3,127	7
CA	1,557	72,160	59,026	11,855	5,642	5,542	0
CO	674	111,829	12,007	111,123	4,178	3,604	5
CT	139	17,357	9,617	24,789	910	770	1
DE	73	18,513	993	31,347	4,764	3,082	1
DC	17	1,816	204	629	708	674	0
FL	2,088	287,611	61,263	637,426	28,847	22,430	9
GA	1,990	342,102	34,613	1,032,735	43,131	36,024	14
ID	33	1,311	1,307	0	105	105	0
IL	2,250	427,699	17,955	1,252,427	23,828	21,922	15
IN	2,413	582,113	22,332	1,635,482	62,416	50,274	20
IA	871	142,261	8,772	200,226	11,095	9,497	7
KS	849	113,034	7,502	86,298	7,256	6,021	7
KY	1,652	512,256	17,530	1,294,604	37,362	29,701	13
LA	746	55,956	13,849	124,416	3,911	3,489	5
ME	59	3,735	4,328	3,915	271	258	0
MD	712	178,528	12,927	383,394	34,044	31,886	6
MA	441	77,314	12,170	96,268	4,781	4,037	2
MI	1,760	309,095	18,686	495,262	36,117	30,199	16
MN	784	118,038	6,426	115,783	21,215	15,430	7
MS	484	65,993	11,182	123,660	5,325	4,324	2
MO	1,778	332,881	14,522	630,371	29,646	27,424	13
MT	328	38,757	3,017	19,861	7,696	4,879	3
NE	446	58,758	3,632	71,490	2,501	2,063	4
NV	486	62,495	9,897	80,206	5,080	4,149	3
NH	197	38,631	4,468	43,766	3,092	2,976	1
NJ	339	104,083	7,120	111,212	7,252	6,694	2
NM	482	86,458	5,670	38,798	9,658	6,598	7
NY	836	113,181	22,668	251,522	18,178	16,783	4
NC	1,514	450,349	18,431	720,875	42,734	35,804	13
ND	791	105,890	6,753	199,510	7,930	6,727	6
OH	2,268	723,494	24,055	2,935,817	95,761	84,758	20
OK	1,034	100,058	28,434	122,317	12,914	11,875	18
OR	278	14,595	8,921	10,034	1,141	1,053	1
PA	1,953	543,445	22,625	1,281,572	79,086	71,136	16
RI	35	797	1,372	0	111	111	0
SC	771	178,209	11,468	252,385	23,129	18,512	5
SD	109	22,930	521	37,069	217	206	1
TN	918	329,848	7,234	776,098	22,500	20,511	8
TX	5,331	409,714	88,688	649,978	50,546	41,001	292
UT	423	77,371	3,523	36,440	5,594	4,361	4
VT	5	265	214	0	17	17	0
VA	789	164,765	16,795	270,035	18,177	16,057	5
WA	427	34,266	10,903	79,018	3,569	3,023	2
WV	1,509	494,211	14,136	1,262,952	39,373	32,189	13
WI	1,143	169,317	11,796	269,725	16,229	14,803	10
WY	764	108,699	6,376	77,919	9,187	7,613	7
National	48,001	8,686,216	750,539	18,738,860	896,790	762,326	612

Table A-14. Electricity Generating Unit with CAAA Scenario – State Emission Summary (tons per year)

Year = 2020

State	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$	NH_3
AL	1,545	49,053	26,893	194,463	20,599	16,194	10
AZ	1,268	67,069	30,168	50,751	13,357	10,793	6
AR	667	32,035	10,744	22,796	5,295	4,749	7
CA	1,560	23,885	59,135	5,066	5,654	5,552	0
CO	674	61,197	11,850	57,045	4,971	4,385	5
CT	120	6,017	8,864	3,901	819	679	1
DE	118	9,644	1,426	28,271	8,425	4,726	1
DC	12	121	468	0	38	38	0
FL	2,077	58,308	61,101	156,096	26,131	19,968	9
GA	1,958	67,210	34,747	160,247	24,729	18,267	13
ID	34	699	1,315	0	106	106	0
IL	2,352	67,196	17,177	238,336	16,417	14,350	16
IN	2,277	78,316	22,243	304,851	41,385	30,620	18
IA	845	55,215	8,536	164,321	10,432	8,894	7
KS	869	40,501	8,301	58,525	7,668	6,433	7
KY	1,655	62,406	17,834	217,881	27,475	19,898	13
LA	663	32,537	11,639	62,034	4,039	3,657	5
ME	68	1,943	4,696	5,229	300	288	0
MD	639	13,497	16,114	23,383	6,913	5,271	4
MA	451	18,037	12,039	17,391	3,582	2,844	16
MI	1,493	92,817	17,002	285,543	26,572	21,902	12
MN	702	40,965	6,221	85,733	20,003	14,677	6
MS	461	8,608	10,276	21,762	4,260	3,258	3
MO	1,781	71,511	13,809	270,564	29,517	27,273	13
MT	325	38,499	2,991	23,171	7,666	4,861	3
NE	448	42,957	3,654	36,751	3,353	2,914	4
NV	479	30,210	9,620	27,424	5,155	4,225	3
NH	212	3,275	5,173	7,426	1,144	1,043	1
NJ	353	13,524	7,667	31,130	6,641	6,083	2
NM	565	72,014	6,436	52,885	11,578	8,064	8
NY	806	22,106	24,667	47,974	10,189	8,983	3
NC	1,571	54,300	18,579	81,118	31,860	24,713	14
ND	785	39,892	9,948	84,365	7,274	6,135	6
OH	2,268	88,465	24,430	235,874	44,411	33,266	20
OK	1,166	57,472	33,410	44,619	14,828	13,790	23
OR	279	11,182	8,969	10,034	1,145	1,057	1
PA	1,819	77,885	21,000	133,215	32,093	24,664	15
RI	29	397	1,139	0	92	92	0
SC	810	39,531	11,291	108,802	24,207	19,451	6
SD	109	1,778	520	4,185	394	382	1
TN	829	22,758	6,940	98,932	11,711	9,851	7
TX	4,808	160,315	99,005	373,713	37,257	28,429	230
UT	422	53,354	3,519	37,504	5,698	4,469	4
VT	9	86	352	0	28	28	0
VA	792	41,522	16,267	72,394	15,960	13,796	6
WA	429	16,154	10,994	12,236	3,577	3,031	2
WV	1,493	40,153	14,255	105,836	25,198	18,205	13
WI	1,141	46,756	11,945	155,793	18,109	16,676	10
WY	754	53,093	6,288	50,554	9,057	7,483	7
National	46,992	1,986,463	771,654	4,270,125	637,311	506,512	559

Table A-15. Nonroad Model Sector – State Emission Summary (tons per year) Year = 1990							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	43,942	27,729	325,257	2,087	3,921	3,609	21
AZ	40,492	18,897	368,150	1,573	2,862	2,634	19
AR	26,692	29,078	188,514	2,274	4,519	4,158	18
CA	270,139	164,566	2,615,018	13,095	22,927	21,101	142
CO	32,472	25,997	293,021	2,133	3,866	3,557	20
CT	33,136	18,369	293,745	1,357	2,439	2,245	16
DE	9,590	5,490	67,735	428	831	765	5
DC	1,453	2,272	13,867	197	277	255	1
FL	189,032	79,645	1,432,534	6,873	13,202	12,148	81
GA	66,405	48,508	597,276	3,777	6,464	5,950	37
ID	16,198	13,446	103,274	1,098	2,276	2,094	9
IL	105,715	99,525	970,221	7,652	14,470	13,316	68
IN	55,247	58,967	525,107	4,466	8,184	7,533	38
IA	40,488	74,354	317,009	5,936	12,679	11,666	40
KS	29,687	62,733	269,102	5,026	10,507	9,667	33
KY	31,957	27,658	255,287	2,111	4,054	3,731	19
LA	45,350	30,464	314,835	2,507	4,785	4,404	24
ME	25,253	9,528	139,797	785	1,632	1,502	10
MD	45,110	22,178	386,622	1,826	3,426	3,153	21
MA	59,215	55,981	522,907	4,614	7,180	6,608	40
MI	138,888	63,132	940,478	4,718	9,828	9,045	60
MN	95,892	73,946	547,420	5,884	13,035	11,994	53
MS	28,680	24,108	186,720	1,872	3,640	3,350	16
MO	56,788	55,994	464,923	4,355	9,045	8,323	37
MT	10,078	18,887	69,777	1,562	3,241	2,982	10
NE	21,476	49,299	181,808	3,958	8,514	7,834	25
NV	14,488	10,293	124,664	918	1,496	1,376	8
NH	18,544	7,094	121,552	541	1,121	1,032	7
NJ	81,044	47,409	724,758	3,611	6,516	5,997	40
NM	9,757	7,142	86,030	601	1,070	985	6
NY	146,124	101,942	1,248,144	8,076	14,112	12,988	81
NC	72,873	55,652	631,196	4,128	7,154	6,585	40
ND	16,782	52,561	111,031	4,280	9,445	8,689	25
OH	110,390	84,683	1,011,598	6,421	11,529	10,611	63
OK	29,920	31,457	253,644	2,530	5,028	4,626	21
OR	37,047	32,306	303,335	2,640	4,558	4,194	23
PA	100,227	71,591	949,399	5,257	9,232	8,498	55
RI	7,900	4,181	74,840	290	525	484	4
SC	40,269	25,163	313,984	1,901	3,434	3,161	20
SD	14,179	38,307	97,016	3,098	6,826	6,280	19
TN	49,642	37,282	402,556	2,799	5,105	4,698	27
TX	155,162	129,097	1,492,385	10,355	18,596	17,114	95
UT	19,112	18,530	138,862	1,584	2,524	2,322	13
VT	9,121	4,029	58,575	316	654	602	4
VA	57,593	38,727	504,227	3,092	5,426	4,994	31
WA	57,729	45,963	469,079	3,728	6,621	6,092	34
WV	12,395	9,457	98,619	757	1,351	1,243	7
WI	79,627	48,340	528,848	3,678	7,475	6,879	39
WY	6,409	5,784	41,516	489	960	884	4
National	**2,665,710**	**2,067,745**	**22,176,262**	**163,254**	**308,562**	**283,960**	**1,530**

Table A-16. Nonroad Model Sector without CAAA Scenario – State Emission Summary (tons per year) Year = 2000							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	53,820	31,262	372,810	2,448	4,026	3,706	26
AZ	59,027	29,411	529,872	2,548	3,863	3,555	29
AR	33,704	32,157	222,627	2,618	4,231	3,894	22
CA	326,970	175,652	3,063,853	13,990	22,153	20,392	165
CO	46,389	36,508	414,449	3,126	4,449	4,094	30
CT	37,773	19,561	313,432	1,469	2,416	2,224	18
DE	12,147	6,229	81,606	501	890	819	6
DC	1,770	2,510	16,494	223	263	242	2
FL	247,749	91,075	1,773,150	8,034	14,517	13,359	102
GA	84,206	54,575	721,098	4,364	6,544	6,024	45
ID	23,253	15,914	143,181	1,363	2,283	2,101	13
IL	120,255	107,240	1,057,828	8,543	13,127	12,082	79
IN	62,031	63,579	564,436	4,987	7,383	6,796	44
IA	43,362	66,451	331,671	5,473	9,452	8,697	41
KS	31,014	56,532	282,673	4,672	7,796	7,174	34
KY	38,863	30,462	289,083	2,428	3,899	3,589	23
LA	59,188	35,860	378,614	3,035	4,963	4,567	30
ME	29,219	9,113	151,874	779	1,513	1,393	11
MD	57,826	25,348	476,411	2,138	3,660	3,368	26
MA	66,943	58,913	557,415	4,964	6,679	6,148	45
MI	163,257	68,336	1,025,870	5,264	9,820	9,039	68
MN	110,711	69,744	597,896	5,743	10,858	9,992	58
MS	35,513	26,214	212,054	2,118	3,464	3,188	19
MO	65,814	54,589	506,622	4,368	7,593	6,988	40
MT	13,405	20,809	91,645	1,818	2,866	2,637	13
NE	22,183	43,112	188,064	3,574	6,189	5,694	25
NV	21,630	16,878	184,006	1,560	2,065	1,900	14
NH	21,517	7,412	130,882	578	1,136	1,046	8
NJ	90,952	44,342	764,610	3,442	5,867	5,401	42
NM	14,327	10,371	123,135	909	1,303	1,199	9
NY	164,324	95,294	1,317,944	7,720	12,352	11,369	85
NC	91,665	62,389	747,981	4,758	7,240	6,666	49
ND	15,930	44,143	107,183	3,726	6,628	6,098	24
OH	126,565	92,472	1,096,259	7,220	10,970	10,098	72
OK	37,646	34,310	299,698	2,858	4,599	4,232	25
OR	45,574	32,126	353,188	2,687	4,032	3,711	26
PA	110,240	67,201	983,603	5,082	8,001	7,366	57
RI	8,949	4,476	79,614	314	527	485	4
SC	51,124	28,120	374,881	2,184	3,553	3,271	24
SD	14,070	32,441	95,892	2,714	4,840	4,453	18
TN	60,391	42,613	455,965	3,324	5,164	4,753	33
TX	196,136	151,825	1,806,737	12,571	18,494	17,021	121
UT	28,893	29,753	201,572	2,660	3,398	3,127	22
VT	10,394	4,175	63,034	336	622	573	4
VA	72,691	43,337	611,010	3,566	5,520	5,081	38
WA	71,028	46,827	548,835	3,885	6,042	5,560	39
WV	16,084	10,201	117,908	854	1,337	1,230	9
WI	92,027	51,525	573,617	4,058	7,029	6,470	45
WY	9,260	7,323	56,647	653	1,007	927	6
National	**3,217,810**	**2,190,711**	**25,458,930**	**178,247**	**286,623**	**263,798**	**1,789**

Table A-17. Nonroad Model Sector with CAAA Scenario – State Emission Summary (tons per year) Year = 2000							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	44,858	29,251	342,388	2,440	3,703	3,409	25
AZ	42,890	28,754	399,760	2,532	3,502	3,223	28
AR	28,789	30,154	205,584	2,615	3,960	3,644	22
CA	237,704	173,505	2,545,659	13,849	20,306	18,692	155
CO	34,860	35,055	331,499	3,116	4,066	3,742	28
CT	29,108	19,203	269,131	1,461	2,221	2,045	17
DE	9,883	6,030	70,298	499	828	762	5
DC	1,325	2,312	14,030	223	235	216	2
FL	199,860	87,328	1,615,215	7,984	13,469	12,394	97
GA	65,496	51,708	652,492	4,344	5,977	5,502	43
ID	20,104	14,900	132,021	1,361	2,139	1,968	13
IL	92,821	103,083	903,590	8,518	12,203	11,232	76
IN	48,335	60,519	495,224	4,975	6,831	6,289	42
IA	36,118	63,331	305,719	5,468	9,032	8,311	40
KS	24,643	53,788	258,535	4,667	7,427	6,834	33
KY	31,866	28,654	257,911	2,400	3,598	3,312	22
LA	50,612	33,630	348,656	3,029	4,618	4,250	29
ME	26,383	8,520	141,934	777	1,417	1,304	11
MD	43,517	24,451	405,801	2,086	3,302	3,039	25
MA	51,540	55,541	472,964	4,952	6,059	5,577	43
MI	141,156	66,015	927,039	5,242	9,195	8,464	66
MN	99,685	66,560	560,423	5,735	10,360	9,533	57
MS	30,441	24,366	195,891	2,115	3,218	2,962	19
MO	53,244	52,750	435,492	4,357	7,172	6,601	39
MT	11,540	19,530	83,398	1,818	2,711	2,494	13
NE	18,086	41,142	172,714	3,571	5,930	5,457	25
NV	15,932	15,855	136,245	1,555	1,853	1,705	13
NH	18,543	7,234	116,450	575	1,064	979	8
NJ	70,056	44,142	656,694	3,420	5,469	5,035	40
NM	11,145	9,834	103,800	906	1,190	1,095	8
NY	131,373	91,741	1,152,540	7,601	11,400	10,493	81
NC	72,886	59,010	682,700	4,740	6,618	6,094	47
ND	13,960	42,079	99,721	3,726	6,396	5,884	24
OH	99,443	87,927	1,001,470	7,193	10,096	9,294	69
OK	31,125	32,566	274,135	2,852	4,319	3,975	24
OR	35,988	30,556	293,772	2,679	3,711	3,416	25
PA	86,852	65,502	882,345	5,056	7,440	6,850	54
RI	6,822	4,452	68,483	312	484	446	4
SC	41,629	26,561	342,397	2,176	3,262	3,003	23
SD	12,253	30,939	89,217	2,714	4,665	4,292	18
TN	49,234	40,195	418,325	3,314	4,753	4,376	32
TX	150,235	144,201	1,588,807	12,525	17,010	15,655	116
UT	23,972	27,091	180,271	2,657	3,051	2,808	21
VT	9,163	4,008	58,693	335	585	538	4
VA	50,377	37,351	469,485	3,203	4,577	4,213	33
WA	56,903	44,330	494,831	3,872	5,586	5,141	38
WV	13,529	9,657	108,350	851	1,242	1,143	8
WI	80,314	49,305	515,681	4,048	6,588	6,064	43
WY	8,192	6,841	52,330	653	942	866	6
National	**2,564,790**	**2,091,459**	**22,330,110**	**177,095**	**265,778**	**244,620**	**1,715**

Table A-18. Nonroad Model Sector without CAAA Scenario – State Emission Summary (tons per year) Year = 2010							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	67,591	35,516	450,053	2,838	4,535	4,174	31
AZ	81,516	41,374	706,406	3,658	5,251	4,833	41
AR	47,696	36,495	288,481	3,086	4,473	4,117	27
CA	430,704	240,385	3,948,811	19,720	28,682	26,402	222
CO	66,051	50,650	563,214	4,491	5,760	5,301	42
CT	44,371	23,975	370,520	1,845	2,831	2,607	21
DE	15,142	7,935	102,400	655	1,057	973	7
DC	2,199	3,204	20,853	291	322	296	2
FL	297,870	117,240	2,279,309	10,586	17,732	16,318	131
GA	113,005	69,847	934,867	5,715	8,138	7,492	59
ID	34,922	21,443	200,264	1,932	2,834	2,608	19
IL	143,790	129,943	1,244,207	10,854	14,158	13,032	97
IN	76,023	76,397	663,007	6,277	8,020	7,383	54
IA	51,408	71,904	387,699	6,342	8,434	7,761	48
KS	36,214	61,504	329,608	5,437	6,956	6,401	40
KY	49,594	34,810	347,801	2,877	4,217	3,882	27
LA	75,818	40,294	460,599	3,536	5,556	5,113	36
ME	38,410	10,426	188,544	914	1,805	1,661	14
MD	73,674	32,647	610,026	2,822	4,487	4,129	34
MA	78,694	71,895	656,809	6,211	7,812	7,190	54
MI	204,310	81,319	1,221,654	6,479	11,315	10,416	83
MN	140,549	78,755	725,033	6,863	10,908	10,039	70
MS	44,749	29,376	256,504	2,455	3,696	3,402	23
MO	79,387	63,115	603,273	5,289	7,682	7,070	48
MT	20,069	27,865	127,544	2,605	3,245	2,986	19
NE	25,976	45,851	218,075	4,094	5,357	4,929	29
NV	29,651	23,792	237,932	2,231	2,804	2,580	20
NH	27,029	8,987	158,318	718	1,366	1,258	10
NJ	105,833	53,757	895,220	4,328	6,750	6,213	51
NM	20,586	14,396	166,937	1,299	1,726	1,589	12
NY	197,431	115,387	1,564,986	9,722	14,233	13,101	104
NC	121,305	79,466	961,147	6,202	8,893	8,187	63
ND	18,095	45,265	120,743	4,174	5,435	5,001	28
OH	151,760	109,593	1,279,396	8,836	12,186	11,219	87
OK	48,044	38,674	374,839	3,366	4,639	4,269	30
OR	61,988	41,778	459,376	3,593	5,018	4,618	35
PA	137,040	80,596	1,164,773	6,385	9,356	8,614	70
RI	10,450	5,510	93,909	396	618	570	5
SC	65,168	35,659	476,413	2,826	4,332	3,989	31
SD	16,337	33,560	109,567	3,053	4,035	3,712	21
TN	75,071	49,206	544,744	3,935	5,750	5,293	39
TX	250,263	177,683	2,251,419	15,125	20,312	18,696	148
UT	43,170	41,535	277,148	3,804	4,668	4,295	31
VT	13,792	4,913	78,339	412	726	668	6
VA	94,471	55,195	783,097	4,659	6,742	6,205	49
WA	93,913	61,138	710,450	5,231	7,412	6,822	52
WV	25,335	12,826	160,852	1,110	1,770	1,629	12
WI	116,210	61,770	686,423	5,090	7,876	7,249	56
WY	14,123	9,985	80,227	933	1,276	1,174	8
National	**4,076,796**	**2,664,838**	**31,541,817**	**225,300**	**323,187**	**297,466**	**2,248**

Table A-19. Nonroad Model Sector with CAAA Scenario – State Emission Summary (tons per year) Year = 2010							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	32,807	20,561	388,103	220	2,809	2,587	28
AZ	31,954	24,586	514,640	274	3,148	2,898	36
AR	25,430	22,475	248,027	233	2,833	2,608	26
CA	158,493	146,092	3,141,091	1,483	17,636	16,240	195
CO	28,879	30,588	428,135	332	3,465	3,189	38
CT	17,880	14,241	302,171	143	1,732	1,596	19
DE	6,309	4,939	82,948	51	651	599	6
DC	832	1,827	16,639	21	171	158	2
FL	134,625	74,798	1,992,404	817	11,019	10,141	115
GA	48,704	40,267	811,550	432	4,905	4,517	53
ID	20,097	13,575	172,783	144	1,849	1,702	17
IL	62,715	80,790	1,002,083	810	8,893	8,188	90
IN	33,674	46,071	543,453	468	4,966	4,573	50
IA	26,376	49,281	330,912	467	5,786	5,325	46
KS	16,235	41,722	281,425	399	4,705	4,330	38
KY	24,185	21,029	292,235	216	2,607	2,400	25
LA	39,503	24,869	404,247	272	3,421	3,149	33
ME	23,941	6,336	163,387	71	1,238	1,140	13
MD	28,902	20,188	500,653	211	2,738	2,520	29
MA	32,063	41,948	524,188	465	4,477	4,122	50
MI	114,372	49,314	1,030,576	504	7,461	6,870	76
MN	85,753	52,490	623,017	519	7,531	6,931	67
MS	24,105	17,730	220,648	187	2,325	2,141	21
MO	37,299	41,122	489,487	399	5,019	4,620	45
MT	11,442	18,646	107,327	191	2,102	1,934	19
NE	12,632	32,101	187,030	300	3,712	3,416	28
NV	12,051	13,854	174,750	164	1,581	1,455	18
NH	14,950	5,524	132,162	57	900	829	9
NJ	42,841	34,821	740,674	333	4,238	3,903	45
NM	9,284	8,642	135,740	96	1,021	939	11
NY	91,527	73,141	1,308,401	730	8,784	8,088	93
NC	52,802	44,831	823,765	474	5,355	4,933	57
ND	10,493	33,118	100,358	304	3,880	3,570	27
OH	66,464	64,377	1,109,590	668	7,478	6,887	79
OK	22,915	24,701	327,232	252	2,938	2,705	28
OR	28,212	25,231	361,407	269	3,087	2,842	32
PA	63,284	49,904	999,258	484	5,877	5,413	63
RI	4,071	3,230	76,926	31	380	350	4
SC	29,807	20,437	411,628	218	2,643	2,434	27
SD	9,356	24,256	92,135	223	2,866	2,637	20
TN	35,885	28,525	470,976	300	3,502	3,225	36
TX	103,572	106,248	1,906,469	1,133	12,305	11,330	134
UT	22,666	23,218	231,181	281	2,618	2,409	29
VT	8,268	3,041	67,696	32	490	451	5
VA	34,856	29,655	573,021	318	3,694	3,401	39
WA	42,343	37,031	606,385	394	4,587	4,222	47
WV	13,929	7,753	141,754	84	1,098	1,011	11
WI	67,243	38,003	568,880	388	5,178	4,768	52
WY	8,699	6,288	69,536	69	807	743	8
National	**1,874,723**	**1,643,413**	**26,229,083**	**16,930**	**202,507**	**186,440**	**2,042**

Table A-20. Nonroad Model Sector without CAAA Scenario – State Emission Summary (tons per year) Year = 2020							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	74,529	39,048	504,654	3,143	4,886	4,498	34
AZ	101,885	56,527	892,036	5,001	6,843	6,298	53
AR	56,418	41,223	345,036	3,480	4,830	4,446	31
CA	525,023	316,456	4,867,725	26,048	36,065	33,200	282
CO	83,817	67,789	715,422	6,041	7,368	6,781	55
CT	49,846	28,353	423,710	2,204	3,239	2,982	25
DE	17,659	9,685	122,597	806	1,237	1,139	9
DC	2,615	3,925	25,193	358	389	358	3
FL	351,068	144,533	2,765,402	13,118	20,991	19,317	159
GA	135,631	85,419	1,137,270	7,031	9,701	8,930	72
ID	44,363	27,416	254,234	2,491	3,434	3,161	24
IL	161,951	155,202	1,408,969	13,247	15,998	14,726	116
IN	85,396	90,891	745,703	7,632	9,079	8,358	64
IA	57,182	77,083	433,523	6,963	8,196	7,543	53
KS	39,902	66,175	368,295	5,988	6,771	6,231	44
KY	54,907	38,401	389,824	3,211	4,485	4,129	30
LA	88,140	44,606	534,965	3,939	6,121	5,633	41
ME	45,165	11,674	218,838	1,031	2,041	1,878	16
MD	87,782	40,173	740,984	3,495	5,336	4,911	42
MA	88,756	85,224	749,643	7,421	9,056	8,335	64
MI	231,367	95,152	1,375,845	7,728	12,766	11,752	97
MN	161,469	86,658	824,919	7,710	11,358	10,453	80
MS	49,133	31,818	285,714	2,687	3,871	3,563	25
MO	87,833	70,412	679,470	5,999	7,992	7,357	54
MT	25,324	34,979	160,830	3,328	3,780	3,478	25
NE	28,485	48,606	242,648	4,455	5,091	4,685	32
NV	37,069	32,580	300,357	3,067	3,708	3,412	26
NH	31,095	10,519	181,961	848	1,560	1,436	12
NJ	117,096	60,557	1,012,284	4,919	7,401	6,813	57
NM	25,778	19,323	211,156	1,752	2,215	2,039	16
NY	221,359	129,735	1,776,136	11,029	15,629	14,387	118
NC	144,418	96,835	1,160,278	7,603	10,543	9,707	76
ND	19,718	46,830	132,073	4,465	4,970	4,573	30
OH	168,672	128,784	1,431,898	10,572	13,764	12,671	101
OK	56,417	43,311	446,254	3,791	4,949	4,555	35
OR	75,696	53,525	566,453	4,618	6,196	5,703	43
PA	154,059	90,606	1,313,052	7,259	10,330	9,510	79
RI	11,754	6,522	107,498	474	708	652	6
SC	76,934	43,285	573,176	3,449	5,107	4,702	37
SD	17,908	34,905	120,575	3,275	3,729	3,431	23
TN	83,059	54,834	611,051	4,431	6,226	5,732	44
TX	297,143	202,831	2,701,524	17,238	22,536	20,744	172
UT	54,815	56,837	351,975	5,225	6,194	5,700	41
VT	16,211	5,609	90,885	474	817	752	6
VA	112,661	67,406	948,656	5,726	8,009	7,372	60
WA	114,385	78,645	875,800	6,753	9,130	8,403	65
WV	30,594	15,469	194,195	1,348	2,108	1,940	14
WI	132,897	73,036	776,919	6,151	8,907	8,199	65
WY	18,113	12,998	101,871	1,229	1,591	1,464	11
National	**4,753,500**	**3,162,409**	**37,199,473**	**270,252**	**367,252**	**338,036**	**2,665**

Table A-21. Nonroad Model Sector with CAAA Scenario – State Emission Summary (tons per year) Year = 2020							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	24,163	11,550	409,478	39	1,794	1,653	30
AZ	29,291	16,182	620,236	52	2,319	2,136	47
AR	18,132	12,815	273,234	33	1,632	1,504	29
CA	142,339	98,241	3,696,579	296	13,176	12,142	247
CO	25,029	19,473	509,296	51	2,251	2,074	50
CT	14,989	8,686	327,398	28	1,234	1,138	22
DE	5,339	3,259	93,756	10	491	452	8
DC	732	952	18,756	2	89	82	3
FL	124,773	51,199	2,343,203	169	8,752	8,057	139
GA	40,793	23,878	939,111	77	3,290	3,032	65
ID	15,121	8,976	197,443	23	1,213	1,116	22
IL	48,870	49,382	1,053,079	115	5,464	5,034	106
IN	25,411	26,940	563,271	64	2,931	2,702	59
IA	18,772	28,624	334,940	48	3,057	2,814	50
KS	12,262	23,834	291,782	39	2,436	2,243	42
KY	17,014	11,903	305,883	32	1,521	1,401	28
LA	31,093	14,836	444,196	45	2,261	2,082	37
ME	16,013	4,112	164,033	18	856	788	14
MD	26,722	13,584	588,330	43	2,114	1,947	36
MA	25,949	22,579	558,241	62	2,681	2,470	59
MI	78,794	31,774	1,038,036	111	5,042	4,646	86
MN	56,892	32,335	607,800	83	4,507	4,150	73
MS	17,153	9,769	227,392	27	1,363	1,256	23
MO	28,059	24,439	515,853	57	2,963	2,730	50
MT	8,301	12,052	120,863	20	1,229	1,131	24
NE	9,082	18,685	191,786	28	1,913	1,761	31
NV	10,832	8,260	209,419	22	1,015	934	24
NH	10,576	3,674	136,758	14	644	593	10
NJ	35,560	21,274	799,936	64	3,005	2,769	50
NM	7,925	5,498	163,087	15	664	612	15
NY	69,568	43,275	1,390,632	125	5,724	5,274	104
NC	43,948	26,178	934,351	86	3,612	3,331	69
ND	6,742	19,502	94,406	24	1,941	1,786	29
OH	51,909	37,259	1,166,363	107	4,700	4,332	91
OK	18,684	14,683	370,349	35	1,783	1,642	32
OR	23,212	15,799	416,291	44	2,126	1,959	40
PA	47,754	28,343	1,058,002	86	3,754	3,460	70
RI	3,474	2,011	83,452	7	278	256	5
SC	25,851	12,385	467,921	42	1,901	1,752	33
SD	6,127	14,282	88,563	19	1,454	1,338	22
TN	26,360	15,584	495,066	49	2,094	1,930	40
TX	90,205	61,096	2,191,703	177	7,779	7,167	154
UT	17,273	13,021	264,333	36	1,501	1,382	39
VT	5,531	1,920	69,167	7	319	294	6
VA	30,607	18,245	662,632	56	2,600	2,395	48
WA	35,442	23,692	701,359	67	3,240	2,985	59
WV	9,590	4,784	161,275	15	669	616	13
WI	45,054	23,968	561,878	71	3,301	3,041	59
WY	6,331	4,127	78,538	10	504	464	10
National	**1,489,644**	**998,918**	**28,999,459**	**2,750**	**131,185**	**120,854**	**2,399**

Table A-22. Onroad – State Emissions Summary (tons per year) Year = 1990							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	206,699	202,489	2,340,754	11,096	8,631	7,271	3,186
AZ	151,393	162,024	1,616,752	9,213	7,155	6,022	2,672
AR	97,149	102,936	1,160,472	5,801	4,553	3,854	1,578
CA	1,064,709	1,054,362	11,893,765	53,550	40,408	33,382	18,458
CO	133,878	121,169	1,785,066	6,746	5,203	4,360	2,049
CT	105,516	119,584	1,244,747	5,894	4,465	3,698	1,988
DE	28,214	33,501	330,164	1,845	1,438	1,212	527
DC	13,089	13,209	141,600	598	437	354	238
FL	520,817	434,428	5,354,388	22,616	17,177	14,262	7,452
GA	300,864	299,260	3,431,841	16,160	12,490	10,478	4,842
ID	45,534	50,808	569,546	2,789	2,196	1,864	738
IL	367,640	391,956	4,363,438	19,539	14,911	12,415	6,288
IN	215,109	235,391	2,635,044	12,586	9,810	8,273	3,574
IA	108,333	117,732	1,367,697	6,369	4,998	4,233	1,727
KS	103,922	112,697	1,288,874	6,038	4,705	3,967	1,719
KY	146,729	165,155	1,759,072	9,073	7,093	5,992	2,528
LA	132,804	130,927	1,483,152	7,344	5,729	4,834	2,073
ME	52,799	62,624	691,968	3,432	2,711	2,304	890
MD	174,202	186,031	2,107,171	9,568	7,318	6,099	3,059
MA	183,175	187,371	2,206,343	9,036	6,786	5,591	3,183
MI	367,771	386,236	4,611,340	19,652	15,133	12,666	6,026
MN	187,158	194,611	2,384,244	9,932	7,696	6,466	2,933
MS	119,647	120,034	1,352,650	6,887	5,420	4,597	1,830
MO	205,492	224,464	2,532,466	11,946	9,257	7,775	3,542
MT	37,906	44,112	495,698	2,436	1,928	1,640	624
NE	64,758	71,176	814,354	3,837	3,007	2,545	1,048
NV	48,944	45,302	589,060	2,530	1,950	1,634	769
NH	43,604	50,422	569,196	2,700	2,116	1,791	739
NJ	248,800	249,902	2,622,595	12,262	9,162	7,526	4,416
NM	84,002	75,287	1,107,097	4,377	3,423	2,893	1,213
NY	469,026	488,427	5,469,579	24,578	18,700	15,535	8,076
NC	280,106	268,891	3,192,565	13,827	10,572	8,812	4,410
ND	28,910	31,583	374,548	1,709	1,349	1,147	443
OH	388,889	387,688	4,671,949	19,763	15,183	12,690	6,142
OK	149,618	157,614	1,782,079	8,527	6,617	5,565	2,495
OR	113,067	130,902	1,406,346	7,052	5,494	4,632	2,011
PA	369,766	400,873	4,379,790	20,948	16,189	13,583	6,269
RI	31,900	32,369	353,404	1,537	1,146	941	558
SC	163,397	168,069	1,910,134	9,532	7,484	6,338	2,581
SD	32,428	37,098	422,785	2,062	1,634	1,391	523
TN	220,639	222,372	2,568,092	11,965	9,274	7,795	3,516
TX	691,779	669,792	7,966,039	34,938	26,670	22,199	11,284
UT	76,262	65,031	1,012,734	3,553	2,729	2,281	1,105
VT	26,626	31,020	352,112	1,682	1,328	1,129	438
VA	267,173	284,513	3,150,900	15,226	11,782	9,891	4,532
WA	198,215	212,275	2,418,358	10,763	8,258	6,896	3,374
WV	67,569	77,926	833,951	4,404	3,475	2,951	1,156
WI	165,077	193,135	2,094,589	10,435	8,186	6,930	2,843
WY	26,559	31,218	356,490	1,709	1,353	1,151	436
National	**9,327,660**	**9,535,993**	**109,566,997**	**500,064**	**384,733**	**321,852**	**154,103**

Table A-23. Onroad without CAAA Scenario – State Emissions Summary (tons per year) Year = 2000							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	128,854	169,270	1,505,878	12,354	4,823	3,738	5,338
AZ	107,137	179,898	1,200,917	13,828	5,369	4,266	4,990
AR	63,414	104,696	852,352	7,928	3,073	2,440	2,886
CA	604,738	704,422	7,623,547	47,088	18,740	13,582	29,477
CO	90,145	132,619	1,363,869	9,356	3,667	2,822	4,247
CT	60,931	98,417	917,021	6,851	2,674	2,057	3,102
DE	16,926	26,640	231,208	1,986	774	604	825
DC	7,566	9,988	94,032	667	264	197	356
FL	381,392	470,905	3,877,651	33,874	13,266	10,217	15,344
GA	229,852	350,232	2,942,087	26,045	10,136	7,942	10,488
ID	28,224	49,189	417,811	3,660	1,421	1,128	1,340
IL	217,647	340,428	3,190,740	23,600	9,222	7,138	10,348
IN	152,412	247,002	2,177,380	18,063	7,026	5,529	7,058
IA	66,761	107,988	996,849	7,985	3,098	2,460	2,913
KS	58,749	98,200	831,665	7,243	2,814	2,217	2,799
KY	95,071	165,166	1,341,692	12,307	4,778	3,777	4,647
LA	90,197	140,782	1,106,534	10,593	4,115	3,246	4,062
ME	27,740	41,681	446,871	2,786	1,114	845	1,396
MD	100,484	162,019	1,450,413	11,619	4,528	3,508	5,043
MA	108,085	165,752	1,557,672	11,407	4,488	3,439	5,281
MI	216,556	329,963	3,207,627	23,411	9,125	7,111	9,800
MN	119,092	185,594	1,859,027	13,247	5,149	4,044	5,246
MS	77,218	133,324	926,817	10,515	4,090	3,301	3,498
MO	141,073	229,874	2,022,437	16,780	6,523	5,116	6,694
MT	20,362	38,169	331,854	2,841	1,100	880	972
NE	38,659	65,949	576,465	4,866	1,889	1,498	1,791
NV	36,972	57,694	539,037	4,109	1,605	1,245	1,772
NH	24,526	43,449	393,745	3,187	1,237	979	1,193
NJ	136,852	206,035	1,880,996	14,608	5,719	4,381	6,818
NM	51,002	81,998	729,149	6,174	2,396	1,903	2,253
NY	271,169	411,656	3,749,564	29,291	11,444	8,839	12,995
NC	203,151	302,089	2,579,583	22,653	8,812	6,927	8,922
ND	16,270	27,822	263,238	2,054	795	636	711
OH	238,000	357,112	3,419,797	25,509	9,935	7,748	10,606
OK	91,941	148,788	1,216,265	11,125	4,326	3,400	4,380
OR	73,085	120,890	1,089,444	8,912	3,463	2,725	3,414
PA	215,654	348,134	3,034,209	25,319	9,857	7,721	10,223
RI	17,241	25,707	248,532	1,739	682	519	848
SC	102,059	163,918	1,339,764	12,347	4,788	3,801	4,507
SD	18,030	32,782	292,485	2,430	940	753	829
TN	146,899	224,124	1,944,417	16,327	6,358	4,987	6,548
TX	475,185	703,440	5,854,596	51,377	20,035	15,546	22,103
UT	50,065	74,046	734,341	5,147	2,009	1,554	2,260
VT	14,362	25,745	229,987	1,912	741	591	672
VA	155,443	210,399	2,164,320	13,967	5,532	4,108	7,801
WA	112,988	174,224	1,629,804	12,360	4,819	3,735	5,360
WV	36,502	60,151	532,135	4,151	1,629	1,254	1,925
WI	119,809	202,507	1,851,981	14,883	5,783	4,564	5,693
WY	16,493	31,234	269,278	2,281	884	706	797
National	**5,872,983**	**8,782,108**	**79,037,081**	**632,766**	**247,056**	**191,723**	**272,569**

Table A-24. Onroad with CAAA Scenario – State Emissions Summary (tons per year) Year = 2000							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	114,123	158,673	1,369,792	5,719	4,364	3,279	5,338
AZ	94,470	167,877	1,061,081	5,641	4,807	3,704	4,990
AR	59,164	97,742	765,290	3,173	2,743	2,110	2,886
CA	450,793	605,783	5,442,803	14,553	16,528	11,362	29,372
CO	84,020	123,828	1,192,589	4,523	3,334	2,489	4,247
CT	48,231	87,514	706,379	2,006	2,342	1,725	3,102
DE	13,569	24,215	175,681	521	673	503	825
DC	6,281	8,846	72,695	204	231	165	356
FL	349,666	442,574	3,668,439	16,325	12,053	9,004	15,344
GA	207,136	324,829	2,596,468	11,625	9,137	6,944	10,488
ID	26,842	45,626	370,927	1,467	1,269	976	1,340
IL	195,319	307,196	2,533,311	8,463	8,170	6,086	10,348
IN	143,248	228,277	1,874,680	7,341	6,283	4,786	7,058
IA	60,569	99,871	843,185	3,157	2,763	2,125	2,913
KS	57,526	91,849	772,685	3,195	2,533	1,937	2,799
KY	87,788	152,894	1,163,065	4,652	4,248	3,246	4,647
LA	85,239	131,911	1,028,779	4,436	3,688	2,819	4,062
ME	25,801	38,354	405,139	1,394	1,018	749	1,396
MD	81,906	146,756	1,126,155	3,391	3,963	2,943	5,043
MA	90,383	151,252	1,256,434	3,454	3,940	2,890	5,281
MI	204,955	307,765	2,813,626	10,729	8,248	6,233	9,800
MN	110,754	172,012	1,607,489	5,518	4,614	3,508	5,246
MS	70,390	124,556	809,681	3,784	3,623	2,835	3,498
MO	130,923	212,108	1,690,296	6,446	5,808	4,402	6,694
MT	19,677	35,281	292,409	1,100	979	760	972
NE	37,405	61,110	515,564	2,012	1,691	1,300	1,791
NV	38,817	52,484	446,206	1,851	1,448	1,089	1,772
NH	22,402	40,379	340,205	1,128	1,095	837	1,193
NJ	125,832	192,800	1,636,080	4,117	4,994	3,657	6,818
NM	49,604	76,121	658,329	2,485	2,140	1,647	2,253
NY	233,586	377,284	3,275,510	11,077	10,181	7,577	12,995
NC	180,258	280,644	2,220,806	9,981	7,934	6,049	8,922
ND	14,970	25,669	225,326	786	707	548	711
OH	209,588	325,562	2,855,921	11,153	8,941	6,754	10,606
OK	92,325	139,220	1,137,568	4,816	3,889	2,963	4,380
OR	66,130	111,321	915,570	3,784	3,109	2,371	3,414
PA	192,193	322,243	2,688,303	9,877	8,787	6,651	10,223
RI	14,663	23,415	199,789	533	599	435	848
SC	95,561	153,176	1,210,637	5,211	4,293	3,307	4,507
SD	16,795	30,244	248,691	922	835	648	829
TN	132,759	208,153	1,682,967	7,187	5,725	4,354	6,548
TX	445,843	651,699	4,936,993	20,137	17,873	13,384	22,103
UT	45,549	68,322	615,044	2,432	1,821	1,366	2,260
VT	13,342	23,683	215,281	738	659	509	672
VA	143,946	192,975	1,899,714	6,806	5,038	3,614	7,801
WA	97,929	160,123	1,349,110	5,484	4,344	3,259	5,360
WV	34,630	55,782	479,190	1,864	1,470	1,095	1,925
WI	106,361	184,635	1,491,603	5,471	5,131	3,911	5,693
WY	16,496	29,107	247,380	921	789	611	797
National	**5,245,756**	**8,073,738**	**67,130,866**	**253,592**	**220,854**	**165,515**	**272,464**

Table A-25. Onroad without CAAA Scenario – State Emissions Summary (tons per year) Year = 2010							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	120,819	168,910	1,429,004	14,801	4,043	2,952	6,217
AZ	122,342	208,515	1,384,280	19,715	5,200	3,895	7,032
AR	62,394	108,008	870,335	10,060	2,667	1,999	3,593
CA	632,106	773,666	8,255,502	61,415	29,393	22,772	37,730
CO	88,018	141,845	1,403,649	12,201	3,355	2,424	5,424
CT	57,592	96,478	934,807	8,151	2,245	1,625	3,605
DE	17,171	28,777	248,344	2,579	700	515	1,042
DC	6,925	9,639	87,938	755	217	153	394
FL	412,015	534,975	4,155,758	46,068	12,767	9,258	20,385
GA	235,136	378,101	3,106,762	34,328	9,272	6,849	13,523
ID	28,232	52,874	447,293	4,828	1,285	963	1,741
IL	198,735	330,843	3,118,556	27,758	7,632	5,562	11,896
IN	139,977	246,860	2,127,024	22,020	5,918	4,394	8,409
IA	59,050	102,406	943,905	9,249	2,459	1,842	3,330
KS	53,321	95,961	792,240	8,610	2,311	1,715	3,285
KY	87,721	162,481	1,305,609	14,855	3,965	2,958	5,489
LA	88,090	143,418	1,101,942	13,217	3,539	2,633	4,965
ME	23,393	39,995	408,123	3,272	919	657	1,536
MD	98,130	169,676	1,506,086	14,936	4,079	2,977	6,300
MA	98,049	163,181	1,506,407	13,698	3,826	2,766	6,155
MI	195,148	327,905	3,101,987	28,244	7,678	5,642	11,497
MN	108,776	187,307	1,846,778	16,260	4,376	3,238	6,313
MS	66,169	121,486	818,329	12,147	3,161	2,436	3,646
MO	130,174	227,899	1,983,729	20,352	5,475	4,051	7,906
MT	18,942	38,692	336,859	3,564	937	709	1,199
NE	34,806	64,232	554,573	5,779	1,540	1,152	2,104
NV	40,924	69,298	634,935	5,985	1,643	1,199	2,539
NH	23,398	45,160	411,806	4,087	1,089	813	1,501
NJ	131,703	208,293	1,951,564	17,898	4,974	3,586	8,132
NM	50,131	88,414	736,821	8,154	2,167	1,625	2,919
NY	247,324	403,657	3,629,204	34,800	9,578	6,964	15,076
NC	208,880	327,332	2,742,634	29,773	8,021	5,942	11,531
ND	14,058	26,310	249,772	2,381	628	474	815
OH	212,927	347,623	3,256,194	30,277	8,216	6,040	12,271
OK	87,307	151,444	1,199,549	13,844	3,726	2,760	5,348
OR	77,456	135,526	1,237,689	12,047	3,245	2,394	4,732
PA	200,988	344,115	3,005,254	30,520	8,248	6,093	12,023
RI	16,392	25,845	254,506	2,100	589	421	997
SC	103,879	172,920	1,410,216	16,027	4,258	3,190	5,763
SD	16,107	31,596	285,045	2,895	761	575	977
TN	141,401	226,122	1,949,990	20,180	5,446	4,029	7,884
TX	489,910	768,280	6,178,976	68,075	18,612	13,592	28,680
UT	51,355	83,181	783,937	7,172	1,967	1,437	3,024
VT	13,273	26,081	231,885	2,384	629	474	823
VA	150,454	220,961	2,197,966	17,593	5,039	3,495	9,551
WA	117,789	191,099	1,792,178	16,482	4,510	3,289	6,998
WV	30,366	54,544	466,545	4,756	1,312	960	1,997
WI	109,935	203,601	1,845,178	18,288	4,896	3,647	6,838
WY	14,823	30,389	263,724	2,764	729	550	949
National	**5,734,012**	**9,105,919**	**80,491,386**	**797,345**	**229,246**	**169,690**	**336,083**

Table A-26. Onroad with CAAA Scenario – State Emissions Summary (tons per year) Year = 2010							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	57,492	82,083	817,306	584	2,758	1,697	6,217
AZ	57,785	98,904	743,063	689	3,462	2,196	7,032
AR	29,836	52,372	489,958	348	1,774	1,127	3,593
CA	211,083	432,472	2,055,711	1,855	18,877	12,467	36,139
CO	43,913	66,427	805,320	504	2,313	1,405	5,424
CT	22,399	41,560	453,015	335	1,545	940	3,605
DE	7,219	12,953	126,268	98	474	294	1,042
DC	2,819	4,156	44,171	36	153	90	394
FL	206,430	259,871	2,601,463	1,890	8,739	5,319	20,385
GA	106,070	176,756	1,659,243	1,283	6,250	3,897	13,523
ID	14,578	25,735	267,442	168	854	542	1,741
IL	89,513	152,160	1,675,114	1,110	5,205	3,189	11,896
IN	71,515	118,985	1,255,399	802	3,968	2,489	8,409
IA	28,360	49,681	527,308	322	1,635	1,038	3,330
KS	27,945	46,598	481,647	314	1,551	973	3,285
KY	45,128	78,620	774,416	528	2,648	1,672	5,489
LA	43,047	68,835	626,683	476	2,369	1,491	4,965
ME	11,143	18,355	236,866	137	644	388	1,536
MD	41,608	75,702	764,599	590	2,784	1,711	6,300
MA	38,941	70,512	731,334	572	2,631	1,598	6,131
MI	97,935	159,814	1,831,972	1,084	5,200	3,221	11,497
MN	56,418	90,835	1,108,975	601	2,946	1,842	6,313
MS	29,271	57,168	451,440	340	2,041	1,343	3,646
MO	61,237	107,792	1,100,058	752	3,687	2,305	7,906
MT	9,948	18,877	203,268	118	617	397	1,199
NE	17,888	31,207	331,204	203	1,025	649	2,104
NV	20,733	32,205	362,802	237	1,118	687	2,539
NH	11,624	21,969	242,486	144	727	460	1,501
NJ	53,197	91,624	965,570	751	3,427	2,074	8,132
NM	26,746	43,058	450,533	282	1,439	914	2,919
NY	108,692	182,719	1,973,044	1,397	6,546	4,001	15,025
NC	87,562	147,474	1,352,113	1,097	5,390	3,372	11,531
ND	6,992	12,808	145,413	80	414	266	815
OH	99,076	162,319	1,778,406	1,158	5,566	3,450	12,271
OK	46,309	74,708	743,250	509	2,504	1,567	5,348
OR	38,220	64,841	701,075	464	2,190	1,364	4,732
PA	86,363	155,773	1,574,248	1,140	5,557	3,465	12,023
RI	6,481	11,251	124,891	91	409	245	997
SC	49,138	83,883	783,037	557	2,832	1,798	5,763
SD	8,180	15,369	165,672	96	501	322	977
TN	63,331	106,765	1,036,958	747	3,664	2,289	7,884
TX	236,642	365,675	3,510,780	2,686	12,684	7,799	28,680
UT	24,904	38,968	448,984	282	1,339	823	3,024
VT	5,572	11,418	115,854	80	416	266	823
VA	74,812	102,265	1,306,635	842	3,612	2,099	9,551
WA	53,651	88,207	954,033	654	3,079	1,890	6,998
WV	15,045	25,364	277,781	175	897	555	1,997
WI	53,363	97,128	1,050,921	655	3,273	2,062	6,838
WY	7,855	14,842	160,238	93	481	308	949
National	**2,614,007**	**4,349,062**	**42,387,967**	**29,954**	**154,216**	**96,356**	**334,417**

Table A-27. Onroad without CAAA Scenario – State Emissions Summary (tons per year) Year = 2020							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	134,688	188,932	1,600,051	17,447	4,254	3,054	6,972
AZ	160,114	266,544	1,815,576	26,682	6,211	4,562	9,134
AR	73,802	126,740	1,033,708	12,535	2,947	2,171	4,279
CA	772,390	946,249	10,178,487	78,325	48,744	40,220	46,159
CO	108,192	171,887	1,739,214	15,611	3,842	2,727	6,625
CT	66,520	109,872	1,087,545	9,630	2,376	1,690	4,065
DE	20,868	35,029	304,354	3,258	788	570	1,251
DC	7,532	10,389	96,193	836	217	150	417
FL	512,455	665,256	5,193,404	60,312	14,972	10,672	25,479
GA	286,914	457,913	3,810,743	43,910	10,564	7,668	16,516
ID	34,580	64,044	550,320	6,185	1,462	1,075	2,138
IL	222,969	367,358	3,520,149	32,192	7,915	5,669	13,168
IN	158,737	279,839	2,431,142	26,403	6,308	4,604	9,611
IA	64,630	111,362	1,040,184	10,627	2,510	1,846	3,677
KS	59,845	106,645	891,627	10,095	2,414	1,759	3,705
KY	98,979	181,981	1,481,765	17,611	4,174	3,060	6,210
LA	102,967	166,453	1,292,380	16,277	3,873	2,832	5,841
ME	25,949	45,047	453,839	3,940	987	697	1,707
MD	116,878	201,362	1,809,039	18,696	4,557	3,271	7,488
MA	112,974	185,911	1,748,562	16,358	4,097	2,915	6,994
MI	220,217	370,147	3,530,860	33,527	8,120	5,868	12,967
MN	124,110	214,091	2,127,163	19,628	4,703	3,420	7,285
MS	69,056	129,517	858,707	14,095	3,201	2,443	3,819
MO	147,788	257,652	2,265,998	24,301	5,813	4,230	8,969
MT	22,214	45,056	397,809	4,409	1,026	762	1,420
NE	39,014	71,312	624,458	6,768	1,604	1,178	2,374
NV	54,334	90,647	847,278	8,213	2,017	1,446	3,344
NH	28,144	53,650	500,062	5,137	1,216	892	1,805
NJ	154,186	241,926	2,310,159	21,755	5,419	3,842	9,407
NM	61,194	106,748	901,452	10,440	2,461	1,814	3,573
NY	278,572	451,815	4,113,304	40,972	10,089	7,211	16,938
NC	254,941	396,746	3,365,001	38,015	9,124	6,638	14,115
ND	15,391	28,647	276,168	2,741	641	475	903
OH	234,582	384,177	3,616,778	35,430	8,569	6,193	13,662
OK	101,573	175,491	1,403,139	16,992	4,071	2,963	6,279
OR	98,502	169,908	1,585,802	15,800	3,811	2,752	6,076
PA	229,769	391,169	3,462,637	36,479	8,774	6,373	13,681
RI	19,042	29,683	297,477	2,496	629	442	1,129
SC	125,150	205,968	1,705,201	20,255	4,777	3,515	6,986
SD	18,026	34,994	321,400	3,401	792	588	1,104
TN	162,788	258,539	2,260,163	24,400	5,859	4,262	9,074
TX	604,955	941,781	7,659,396	88,040	21,517	15,439	35,460
UT	64,511	103,664	990,369	9,558	2,339	1,684	3,803
VT	15,572	30,471	274,419	2,951	690	511	976
VA	177,231	260,230	2,600,367	21,797	5,638	3,845	11,260
WA	147,409	237,738	2,254,651	21,470	5,254	3,764	8,717
WV	31,801	58,033	489,833	5,490	1,343	974	2,094
WI	125,643	232,607	2,129,530	22,079	5,250	3,844	7,871
WY	16,842	34,200	301,682	3,314	774	574	1,089
National	**6,784,539**	**10,695,419**	**95,549,545**	**986,882**	**268,733**	**199,153**	**397,618**

Table A-28. Onroad with CAAA Scenario – State Emissions Summary (tons per year) Year = 2020							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	36,233	36,503	686,205	675	2,240	1,115	6,972
AZ	39,115	44,182	691,822	920	3,097	1,564	9,134
AR	20,049	23,627	434,920	426	1,451	732	4,279
CA	135,139	227,768	1,124,224	2,373	21,601	14,017	43,870
CO	28,280	29,091	724,825	634	2,078	1,028	6,625
CT	12,595	15,144	371,326	388	1,279	634	4,065
DE	4,426	5,116	109,541	122	407	203	1,251
DC	1,526	1,503	34,666	39	125	61	417
FL	142,711	129,309	2,420,605	2,432	8,017	3,971	25,479
GA	68,610	76,061	1,478,156	1,612	5,406	2,705	16,516
ID	10,076	11,878	245,498	212	722	364	2,138
IL	52,109	59,852	1,379,170	1,264	4,188	2,080	13,168
IN	45,463	51,447	1,078,243	944	3,183	1,597	9,611
IA	17,740	20,891	437,904	365	1,241	625	3,677
KS	17,818	20,232	407,769	363	1,223	613	3,705
KY	28,638	33,545	658,479	614	2,081	1,047	6,210
LA	27,709	29,931	539,289	575	1,944	977	5,841
ME	7,040	8,085	201,095	158	540	268	1,707
MD	25,413	30,220	663,099	722	2,398	1,193	7,488
MA	22,804	26,520	624,012	675	2,205	1,093	6,991
MI	62,474	70,841	1,560,737	1,259	4,203	2,098	12,967
MN	36,731	40,829	964,921	713	2,396	1,200	7,285
MS	16,923	21,171	348,872	371	1,425	736	3,819
MO	37,959	45,064	933,400	879	2,956	1,481	8,969
MT	6,710	8,418	180,445	143	493	250	1,420
NE	11,441	13,438	280,811	235	797	401	2,374
NV	14,028	14,017	346,040	321	1,065	529	3,344
NH	8,117	10,263	221,371	179	606	305	1,805
NJ	30,730	34,428	811,391	894	2,937	1,452	9,407
NM	18,648	19,745	411,146	355	1,211	611	3,573
NY	68,431	78,010	1,687,592	1,624	5,368	2,664	16,932
NC	53,193	57,875	1,159,040	1,381	4,642	2,325	14,115
ND	4,393	5,373	120,755	91	310	157	903
OH	59,218	65,840	1,465,605	1,327	4,433	2,213	13,662
OK	30,680	33,846	654,231	615	2,068	1,037	6,279
OR	26,484	30,088	663,799	607	1,977	987	6,076
PA	52,005	61,415	1,306,128	1,336	4,483	2,244	13,681
RI	3,747	4,278	104,760	107	348	171	1,129
SC	33,540	38,479	707,534	694	2,360	1,190	6,986
SD	5,243	6,531	140,450	111	382	193	1,104
TN	39,206	44,505	877,678	885	2,982	1,494	9,074
TX	156,847	165,913	3,198,831	3,416	11,336	5,638	35,460
UT	16,511	17,010	409,525	367	1,222	609	3,803
VT	3,246	4,161	96,954	98	335	170	976
VA	48,632	48,807	1,154,156	1,023	3,330	1,618	11,260
WA	34,504	37,552	858,460	838	2,779	1,381	8,717
WV	8,652	10,014	218,768	191	688	345	2,094
WI	33,693	40,596	907,443	776	2,627	1,321	7,871
WY	5,139	6,425	137,819	109	375	190	1,089
National	**1,670,617**	**1,915,842**	**36,239,508**	**36,457**	**135,559**	**70,899**	**395,319**

Table A-29. Nonpoint – State Emissions Summary (tons per year) Year = 1990							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	282,863	85,430	895,239	81,428	484,271	139,028	72,111
AZ	148,636	90,281	795,387	10,360	312,561	109,055	38,786
AR	126,682	72,114	244,374	22,467	327,873	73,548	106,505
CA	905,435	349,394	1,322,689	73,818	1,415,109	410,969	132,373
CO	178,221	65,784	722,292	83,839	372,051	116,912	69,011
CT	236,546	16,821	252,667	16,316	105,835	36,027	7,434
DE	33,159	13,162	34,508	8,961	25,845	9,912	11,785
DC	10,625	2,079	2,147	5,419	10,709	2,661	922
FL	369,573	87,000	787,076	46,108	649,345	184,818	63,693
GA	240,011	80,564	541,894	9,963	696,242	160,895	71,292
ID	67,514	22,814	188,565	8,723	368,146	60,283	43,848
IL	373,519	267,524	163,376	44,594	889,066	189,236	143,431
IN	255,896	116,184	157,555	205,041	595,944	117,968	112,077
IA	146,413	60,034	160,526	14,128	481,188	98,348	316,800
KS	203,428	126,609	1,012,701	16,910	1,295,035	276,806	126,447
KY	161,187	135,099	206,216	53,814	231,308	65,973	54,173
LA	199,064	253,038	479,294	122,982	366,030	120,422	65,719
ME	159,909	15,445	203,097	21,228	153,679	109,105	8,271
MD	196,396	53,564	247,723	107,736	188,838	57,757	29,556
MA	276,232	50,805	238,949	83,227	318,119	76,741	15,448
MI	359,784	149,296	153,594	62,640	467,118	103,599	77,985
MN	237,764	80,378	307,012	11,922	772,882	146,871	94,531
MS	179,247	94,203	243,268	84,462	376,981	82,627	61,349
MO	226,317	99,252	353,545	39,372	929,339	154,817	139,255
MT	52,986	69,635	130,243	5,077	380,145	65,998	37,015
NE	80,516	84,961	103,674	11,785	447,945	74,562	171,805
NV	41,550	17,081	51,424	3,902	102,395	20,540	6,135
NH	103,191	9,995	128,899	47,251	50,537	22,894	2,864
NJ	317,671	142,467	190,054	133,059	241,341	73,258	16,632
NM	81,213	61,912	637,573	11,702	1,603,581	248,689	25,669
NY	1,153,758	200,223	1,113,436	174,397	695,531	239,124	80,303
NC	359,211	52,446	838,010	36,122	359,252	125,327	94,116
ND	58,527	39,746	50,344	54,275	369,683	71,529	78,569
OH	376,213	198,935	257,700	93,426	543,556	134,746	111,117
OK	166,839	130,577	443,907	23,275	929,700	156,758	93,722
OR	434,204	136,373	510,125	35,143	681,919	285,766	46,636
PA	416,870	191,992	342,605	109,073	461,058	122,265	82,056
RI	27,785	7,276	12,344	8,784	22,237	6,177	744
SC	246,977	33,196	334,445	15,506	318,645	72,483	32,822
SD	49,065	11,410	124,621	12,634	281,913	61,190	85,074
TN	247,996	101,887	231,344	46,868	254,171	74,390	45,479
TX	704,658	390,444	728,283	62,706	3,595,417	553,042	345,568
UT	75,494	40,789	140,428	14,230	108,303	33,692	18,601
VT	36,698	13,817	66,504	9,840	63,842	16,128	9,835
VA	317,064	97,228	336,088	187,104	299,547	86,495	44,070
WA	297,474	124,370	428,257	22,140	495,211	132,065	41,153
WV	86,778	76,266	102,518	55,671	102,340	27,767	15,875
WI	337,938	91,757	318,969	44,234	444,025	116,086	143,743
WY	32,943	89,358	179,238	15,935	469,231	65,278	17,442
National	**11,678,038**	**4,801,016**	**17,514,726**	**2,469,598**	**25,155,038**	**5,790,623**	**3,509,844**

Table A-30. Nonpoint without CAAA Scenario – State Emissions Summary (tons per year) Year = 2000							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	289,028	98,077	880,888	77,884	495,416	143,888	77,414
AZ	201,867	91,915	807,977	11,427	385,720	126,483	43,257
AR	151,880	75,860	244,011	6,238	298,537	72,509	133,220
CA	1,137,661	263,161	1,245,360	43,825	1,447,603	413,114	171,607
CO	212,681	87,323	704,863	83,828	484,786	138,122	80,733
CT	220,813	17,265	198,385	15,496	114,594	34,866	6,998
DE	36,087	16,242	33,023	11,734	30,615	10,992	12,683
DC	11,549	2,030	1,838	2,522	12,793	3,081	1,089
FL	463,529	92,702	824,208	32,030	742,340	211,376	68,917
GA	300,730	87,955	587,750	9,240	716,746	175,933	84,685
ID	74,921	26,973	190,787	8,541	354,289	61,778	59,904
IL	434,262	230,291	135,230	26,956	917,154	193,746	151,793
IN	310,555	108,396	143,534	177,656	594,287	118,139	114,043
IA	164,423	57,280	140,990	15,893	482,979	95,744	295,927
KS	209,201	112,716	934,433	16,113	1,297,690	269,621	145,109
KY	179,079	136,949	190,643	40,717	245,747	68,129	66,044
LA	225,369	265,230	489,029	135,355	402,560	133,382	80,610
ME	139,100	14,765	156,555	15,238	154,819	109,614	9,007
MD	207,747	55,393	234,408	79,563	219,318	62,642	27,941
MA	283,182	49,590	190,062	67,774	324,173	74,100	15,339
MI	432,159	146,039	134,468	45,985	486,446	105,761	80,225
MN	267,620	73,222	273,309	9,113	812,859	148,458	117,959
MS	204,302	92,742	245,339	11,004	357,426	81,083	80,143
MO	252,572	87,490	313,507	27,354	1,003,512	160,680	161,218
MT	56,594	83,792	123,426	5,173	359,581	64,236	45,102
NE	89,415	78,583	94,486	10,530	460,866	74,501	182,755
NV	57,206	18,001	54,765	4,102	141,663	29,252	6,373
NH	93,310	9,712	98,246	50,239	50,745	20,290	2,715
NJ	336,283	175,776	158,793	128,310	248,557	73,390	17,503
NM	93,396	72,843	637,794	13,029	1,522,037	244,187	38,316
NY	1,020,931	222,449	867,288	142,316	651,826	211,240	78,405
NC	453,953	61,888	1,001,689	27,573	401,579	137,883	157,338
ND	58,551	41,595	42,804	55,787	358,929	68,004	93,948
OH	442,392	183,123	226,938	55,232	572,246	138,526	125,454
OK	190,183	111,332	467,851	25,051	794,097	148,036	128,128
OR	408,548	113,066	415,443	40,037	609,896	270,824	51,799
PA	458,131	136,550	293,980	89,444	448,068	118,485	86,278
RI	32,903	7,015	9,708	7,859	25,103	6,653	813
SC	265,154	33,963	317,473	13,886	318,857	73,950	39,281
SD	51,871	13,448	117,905	29,225	281,849	59,957	97,571
TN	294,882	99,895	224,029	43,063	289,351	81,950	48,908
TX	843,544	393,798	722,503	61,931	3,377,133	563,029	395,353
UT	98,275	46,150	142,168	11,657	161,616	45,206	24,902
VT	36,816	15,514	53,280	12,443	61,211	14,710	9,581
VA	344,530	96,840	316,444	146,258	325,249	91,773	50,204
WA	299,598	79,997	381,194	13,595	485,682	128,611	43,686
WV	92,839	77,338	92,854	59,289	99,386	26,813	17,674
WI	342,375	137,525	268,581	145,365	452,341	112,750	125,925
WY	35,439	91,951	174,284	16,777	423,274	61,612	19,998
National	**12,907,437**	**4,691,751**	**16,604,526**	**2,179,658**	**25,303,549**	**5,879,111**	**3,973,874**

Table A-31. Nonpoint with CAAA Scenario – State Emissions Summary (tons per year) Year = 2000							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	240,301	81,419	821,832	60,791	404,172	115,233	74,045
AZ	112,155	50,662	769,157	8,448	275,311	92,645	38,063
AR	111,784	65,589	337,975	31,879	266,086	74,624	121,382
CA	482,735	298,226	949,570	117,653	585,454	191,235	167,901
CO	103,407	36,283	664,830	86,460	295,149	89,409	73,007
CT	145,254	17,325	147,415	19,163	48,484	14,667	5,469
DE	15,473	13,724	16,243	9,340	13,562	3,680	12,846
DC	3,873	2,316	1,897	1,597	6,203	1,025	13
FL	469,364	90,538	784,496	79,653	397,323	118,210	55,965
GA	303,342	86,261	528,435	61,922	640,122	132,370	81,966
ID	140,931	39,875	211,929	3,471	342,674	69,461	64,060
IL	276,627	164,281	114,592	16,570	696,887	127,369	108,356
IN	177,935	81,404	90,781	65,117	619,427	114,020	97,177
IA	78,134	40,886	102,728	21,910	477,728	86,062	258,231
KS	135,769	73,967	873,048	38,237	728,425	175,025	113,974
KY	105,477	79,639	143,891	43,196	233,319	52,614	51,147
LA	153,346	227,053	454,570	33,217	238,221	72,648	70,762
ME	87,678	9,136	107,741	10,165	61,241	19,541	7,771
MD	127,931	37,811	160,837	46,469	102,270	30,331	25,168
MA	177,371	48,649	162,558	57,741	195,577	45,258	12,374
MI	238,631	83,927	128,711	56,105	415,863	75,110	64,597
MN	127,273	105,721	233,404	20,721	740,596	125,818	73,245
MS	159,191	79,672	171,423	16,050	351,538	65,739	70,233
MO	166,665	100,236	253,015	51,511	962,242	140,326	122,253
MT	27,729	48,848	105,621	4,906	342,012	57,519	46,233
NE	42,274	65,511	85,704	32,584	451,418	69,773	173,321
NV	23,012	16,680	45,307	13,320	110,989	17,890	5,886
NH	61,058	13,245	80,742	7,685	43,226	17,551	2,205
NJ	148,622	46,191	101,858	22,872	61,176	17,866	15,594
NM	64,390	47,112	627,108	7,808	849,019	137,999	39,036
NY	743,008	158,481	636,715	126,096	433,780	123,897	67,105
NC	280,781	52,446	739,227	24,432	291,214	83,963	158,861
ND	15,589	56,340	46,429	124,008	406,843	74,880	71,494
OH	278,483	134,837	179,375	30,365	465,017	89,870	109,319
OK	200,782	115,394	451,548	9,102	711,524	127,313	113,407
OR	387,508	117,882	353,028	13,741	518,182	231,467	54,546
PA	277,349	113,019	290,523	75,384	393,149	78,454	80,375
RI	11,947	3,843	8,514	3,443	7,998	2,000	251
SC	188,661	39,298	289,309	32,329	278,564	58,110	37,721
SD	22,946	10,075	104,325	10,947	286,231	57,868	102,348
TN	146,509	68,308	157,291	38,886	234,848	53,333	34,487
TX	720,854	514,714	934,794	137,312	2,362,922	356,783	387,490
UT	65,822	23,313	150,796	4,491	92,701	25,875	26,301
VT	18,505	3,487	44,326	5,391	55,791	10,905	9,054
VA	201,099	91,873	239,836	132,324	744,649	155,078	45,666
WA	166,822	101,260	267,987	20,694	271,526	72,575	44,078
WV	58,630	46,759	79,507	20,321	111,960	24,927	16,311
WI	227,951	52,366	202,207	11,178	295,607	67,594	121,192
WY	23,368	29,823	160,814	8,278	411,631	57,337	19,286
National	**8,544,345**	**3,885,707**	**14,613,968**	**1,875,282**	**19,329,848**	**4,103,247**	**3,551,567**

Table A-32. Nonpoint without CAAA Scenario – State Emissions Summary (tons per year) Year = 2010							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	300,237	101,187	865,612	79,324	434,536	136,422	83,481
AZ	245,205	103,796	817,255	11,951	408,916	133,835	51,175
AR	173,559	93,581	244,248	62,670	281,382	71,239	148,024
CA	1,345,772	300,394	1,176,072	53,993	1,555,605	434,219	198,822
CO	240,885	79,775	687,041	85,430	507,387	141,359	74,359
CT	214,928	15,581	158,632	16,134	112,783	32,311	6,414
DE	40,760	16,209	32,279	17,877	32,257	11,443	13,892
DC	12,780	2,315	1,659	4,096	13,291	3,224	1,284
FL	564,113	105,149	841,605	41,496	785,007	223,869	71,740
GA	357,672	100,715	610,509	10,483	726,491	182,951	96,002
ID	80,915	24,603	195,200	10,063	322,287	60,300	76,570
IL	477,544	230,424	115,936	34,704	875,114	181,218	164,260
IN	351,699	108,457	134,823	192,508	597,027	114,710	122,216
IA	179,962	58,170	124,574	17,027	461,239	89,029	306,551
KS	217,568	108,292	878,757	16,712	1,275,407	259,765	148,389
KY	197,802	135,403	175,797	44,556	220,843	62,912	73,781
LA	258,201	294,062	484,544	258,811	391,420	132,188	88,667
ME	124,962	14,818	120,331	13,728	154,476	109,248	9,031
MD	230,871	63,505	236,901	89,198	226,380	63,214	29,392
MA	291,925	44,338	154,401	70,258	319,679	70,150	15,694
MI	480,213	149,423	134,310	51,116	494,015	102,389	83,153
MN	292,774	74,311	246,200	10,147	812,139	143,724	121,436
MS	221,222	108,387	240,039	45,457	302,249	74,236	90,520
MO	276,220	87,561	280,654	33,330	1,029,776	159,549	165,990
MT	59,939	65,552	114,613	4,176	322,931	59,264	45,817
NE	98,662	78,085	87,230	14,047	456,531	71,830	183,098
NV	70,869	22,128	56,636	4,137	152,698	32,368	6,305
NH	87,127	19,161	79,442	111,723	51,147	18,682	2,353
NJ	360,741	154,183	128,118	103,853	251,837	71,974	18,352
NM	106,416	88,879	638,624	24,340	1,401,764	233,620	47,366
NY	933,547	202,713	661,149	137,178	616,334	187,888	76,160
NC	526,931	70,647	1,050,621	29,859	411,639	141,192	175,906
ND	62,026	43,826	37,462	59,829	333,077	61,862	94,004
OH	498,650	183,971	210,172	61,218	556,367	132,429	131,291
OK	215,026	110,603	447,565	28,368	722,272	137,875	138,584
OR	392,163	122,510	317,441	41,404	565,252	257,321	54,763
PA	512,062	129,698	270,795	96,834	436,995	114,729	88,537
RI	38,569	6,186	8,791	7,112	25,373	6,678	863
SC	297,075	36,782	307,153	14,912	319,710	74,234	44,211
SD	54,655	12,481	111,477	23,528	268,971	56,488	101,223
TN	332,211	106,698	218,132	48,329	270,339	78,610	51,782
TX	991,322	440,914	709,450	64,549	3,185,502	544,547	413,362
UT	117,683	41,196	151,848	11,907	181,187	50,418	26,579
VT	36,674	14,745	42,165	13,418	59,326	13,537	8,181
VA	388,141	102,692	320,403	139,985	335,607	94,068	51,567
WA	317,635	98,429	348,268	15,108	496,549	130,323	43,033
WV	105,494	74,449	86,046	44,656	98,003	25,847	17,997
WI	344,652	148,741	229,961	177,665	435,770	104,935	113,508
WY	38,351	86,221	170,491	23,221	361,743	55,424	20,413
National	**14,164,412**	**4,881,947**	**15,761,435**	**2,572,424**	**24,656,631**	**5,749,651**	**4,196,096**

Table A-33. Nonpoint with CAAA Scenario – State Emissions Summary (tons per year) Year = 2010							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	251,487	77,240	813,929	66,485	367,436	111,913	80,136
AZ	119,984	45,534	773,435	7,706	282,332	94,338	45,375
AR	124,859	57,965	342,226	30,908	264,583	74,741	133,636
CA	438,528	272,072	939,367	104,757	565,554	189,639	188,367
CO	111,069	33,725	685,580	86,375	296,706	92,660	67,616
CT	146,317	17,603	134,267	19,838	48,657	14,317	5,095
DE	16,015	14,854	15,007	9,211	14,282	3,777	13,688
DC	3,596	2,499	1,974	1,663	6,467	1,099	14
FL	485,318	91,464	802,954	86,740	412,005	123,150	57,375
GA	352,067	82,875	549,970	63,196	642,107	135,274	90,889
ID	178,710	43,128	219,476	2,899	316,416	70,383	76,411
IL	303,124	138,217	109,403	13,001	650,405	117,197	114,318
IN	198,838	70,854	85,907	60,174	592,205	106,991	102,849
IA	82,370	33,807	96,580	22,714	459,805	81,225	273,982
KS	138,478	63,424	866,647	39,419	716,700	170,184	115,686
KY	111,087	75,931	141,034	43,141	222,420	51,788	54,677
LA	170,484	233,811	460,570	31,287	237,605	73,123	78,789
ME	81,774	9,938	83,827	11,516	60,907	18,908	7,981
MD	137,099	38,346	156,894	44,014	105,162	31,041	26,092
MA	164,481	48,252	141,716	58,498	195,221	45,923	12,639
MI	252,667	87,166	136,272	54,934	410,561	73,766	66,202
MN	127,920	105,214	228,687	20,781	742,666	124,212	73,301
MS	147,860	74,484	170,921	15,452	311,117	61,023	78,036
MO	178,655	90,054	240,741	54,087	997,338	142,828	124,699
MT	28,362	44,743	103,690	3,088	311,767	53,917	47,058
NE	44,316	46,658	84,092	33,248	449,819	67,046	172,520
NV	25,990	15,459	48,154	14,051	118,752	19,429	5,730
NH	56,893	14,307	66,874	8,225	44,855	17,958	2,031
NJ	126,978	47,389	85,795	24,001	62,918	17,371	16,140
NM	67,471	37,851	628,054	6,875	747,089	128,045	44,706
NY	694,835	160,045	505,475	123,000	417,797	117,776	65,733
NC	311,843	50,471	791,155	26,079	299,858	86,924	170,538
ND	15,563	53,567	45,996	136,098	389,738	70,632	69,969
OH	306,957	121,975	167,568	29,128	448,761	85,752	113,646
OK	206,914	109,162	458,419	8,487	693,689	125,394	122,291
OR	426,281	116,355	448,479	14,071	489,090	241,102	56,590
PA	286,184	112,412	292,389	75,803	387,488	77,705	81,826
RI	12,465	3,840	8,250	3,526	8,215	2,074	244
SC	170,920	37,907	295,802	34,288	277,807	58,971	42,038
SD	23,500	9,360	101,790	11,806	275,729	55,345	102,159
TN	156,205	63,576	156,071	38,007	228,653	52,953	35,232
TX	798,029	506,308	961,050	135,758	2,346,634	356,402	400,249
UT	73,495	20,077	156,440	3,717	101,731	27,902	26,596
VT	18,223	3,758	45,560	6,108	55,715	11,306	7,866
VA	203,687	91,578	234,314	133,458	753,364	157,183	48,341
WA	171,283	98,531	265,046	20,025	255,394	73,054	44,773
WV	59,699	45,167	78,982	21,301	114,766	25,645	16,636
WI	239,051	47,862	218,552	10,854	286,871	68,615	112,822
WY	24,344	21,473	159,726	7,833	359,784	52,024	19,577
National	**8,872,274**	**3,688,289**	**14,605,108**	**1,877,630**	**18,844,942**	**4,060,025**	**3,713,161**

Table A-34. Nonpoint without CAAA Scenario – State Emissions Summary (tons per year) Year = 2020							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	334,845	106,536	870,116	81,270	406,162	135,852	93,752
AZ	314,770	116,128	835,410	12,554	472,696	150,293	60,366
AR	210,255	115,499	253,857	160,543	285,528	74,620	165,108
CA	1,704,558	319,191	1,269,296	56,647	1,857,905	511,602	229,445
CO	298,564	90,676	691,547	85,708	619,070	165,125	78,528
CT	240,105	16,085	160,429	16,070	127,998	35,123	6,703
DE	48,296	17,332	34,454	19,568	37,841	12,975	16,250
DC	14,801	2,592	1,661	4,607	15,931	3,826	1,642
FL	687,143	114,894	883,066	45,764	891,072	252,283	78,979
GA	433,753	111,085	647,895	11,588	756,470	198,895	110,484
ID	98,422	27,078	208,480	10,607	301,012	62,479	90,455
IL	551,584	239,113	116,873	39,718	943,619	194,242	182,806
IN	412,886	113,515	138,692	192,656	638,234	121,897	135,281
IA	204,122	61,676	123,450	17,533	482,694	92,416	326,446
KS	239,773	114,165	895,899	17,599	1,307,281	265,758	152,446
KY	225,234	145,507	179,375	47,410	220,986	64,771	77,969
LA	306,746	356,216	500,799	645,323	425,553	144,340	102,728
ME	134,345	14,848	115,084	14,016	158,965	109,834	9,664
MD	273,809	69,525	255,743	90,734	268,341	72,919	32,337
MA	335,419	45,985	151,956	74,690	345,209	75,009	17,185
MI	558,656	154,014	145,306	55,551	537,835	109,946	87,891
MN	334,957	78,172	246,637	10,767	863,865	152,026	124,436
MS	250,109	116,881	245,390	58,260	268,125	72,168	99,702
MO	317,110	92,715	281,993	34,127	1,100,709	170,059	172,455
MT	68,790	70,660	116,342	4,328	303,423	59,477	47,274
NE	111,470	82,166	87,966	14,395	478,953	74,950	190,053
NV	90,675	24,950	61,483	4,473	186,230	40,355	6,515
NH	94,466	18,662	76,072	107,625	55,896	19,473	2,236
NJ	419,765	159,831	123,425	110,812	275,487	77,640	19,966
NM	125,339	98,511	643,683	27,838	1,284,274	225,962	51,766
NY	979,659	202,207	608,690	138,444	634,148	188,997	77,202
NC	633,678	77,509	1,136,051	31,311	466,804	158,421	198,416
ND	67,442	45,881	36,989	59,281	344,631	63,688	95,310
OH	585,784	194,556	220,930	67,875	604,239	142,659	141,175
OK	256,470	120,732	468,859	33,737	705,744	139,946	148,974
OR	433,702	127,339	324,354	46,080	549,776	264,162	56,478
PA	601,692	133,701	271,278	99,656	455,065	119,818	92,939
RI	46,528	6,396	8,954	7,272	28,951	7,436	1,025
SC	348,579	39,484	321,361	15,674	329,116	78,814	49,144
SD	60,074	12,828	110,919	23,671	280,865	58,489	103,786
TN	381,438	112,595	226,582	52,721	284,215	83,386	54,301
TX	1,193,185	472,129	734,278	81,219	3,205,154	563,914	433,313
UT	148,071	45,868	166,720	12,079	232,569	62,604	27,419
VT	41,444	14,459	40,482	13,621	62,370	14,081	7,194
VA	459,663	110,010	359,124	143,029	373,027	104,731	57,248
WA	379,572	105,362	378,413	15,968	576,100	152,141	44,219
WV	126,221	80,453	87,935	47,783	99,741	26,863	19,130
WI	390,921	149,766	235,041	184,181	459,351	110,290	107,505
WY	44,024	96,867	171,925	25,192	299,367	50,645	21,840
National	**16,618,917**	**5,242,354**	**16,271,263**	**3,171,574**	**25,908,596**	**6,137,398**	**4,507,484**

Table A-35. Nonpoint with CAAA Scenario – State Emissions Summary (tons per year) Year = 2020							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	265,532	79,104	826,803	75,999	330,515	109,611	89,979
AZ	135,448	46,990	785,243	7,793	306,444	99,289	53,961
AR	145,707	59,545	358,579	32,167	262,475	76,621	150,128
CA	521,750	271,013	1,003,081	112,308	575,612	196,381	218,133
CO	123,299	35,955	722,918	86,675	328,302	101,478	71,126
CT	148,316	17,681	140,409	19,828	50,851	13,804	5,034
DE	16,944	16,422	16,781	10,258	15,999	4,043	15,979
DC	3,955	2,669	2,166	1,758	7,491	1,291	16
FL	574,504	96,373	842,368	97,624	434,815	131,176	62,075
GA	417,433	86,690	582,979	65,758	649,306	141,303	104,387
ID	233,175	49,966	241,704	2,639	291,286	73,675	90,703
IL	340,426	136,857	119,127	14,636	682,234	122,545	126,120
IN	231,908	70,187	92,497	55,429	619,437	108,774	114,557
IA	87,369	33,886	101,585	23,221	480,506	84,054	292,997
KS	143,209	63,007	886,803	39,897	751,052	175,772	119,046
KY	117,871	78,521	151,411	45,457	221,944	53,146	58,265
LA	196,341	239,150	476,974	37,801	243,635	76,226	90,476
ME	75,849	10,003	93,367	11,327	62,276	17,861	8,457
MD	152,280	40,801	176,803	43,546	117,031	33,092	28,575
MA	169,627	50,296	155,250	57,783	204,124	46,823	13,182
MI	275,203	95,017	146,660	54,709	436,874	77,093	68,944
MN	130,421	109,117	242,998	22,043	780,465	129,413	74,702
MS	159,265	75,798	175,360	18,041	278,537	58,887	86,782
MO	194,403	90,777	255,266	54,213	1,057,245	150,024	129,900
MT	30,372	42,953	108,319	2,930	289,299	52,926	48,971
NE	47,049	44,746	87,261	33,048	471,464	69,669	179,244
NV	31,396	16,924	52,971	14,879	138,752	22,896	5,805
NH	53,983	15,072	74,143	8,255	47,268	17,962	1,837
NJ	130,286	49,207	91,317	27,258	64,850	16,407	17,039
NM	74,244	38,036	633,589	6,995	622,857	117,314	48,918
NY	675,410	159,882	536,446	120,674	406,706	108,972	63,896
NC	352,094	52,286	853,630	27,363	328,154	94,400	192,267
ND	15,688	52,433	47,310	134,660	401,429	72,334	70,895
OH	343,406	122,025	184,689	31,573	478,556	90,104	122,691
OK	207,521	102,423	481,998	8,815	674,450	126,490	131,654
OR	473,563	118,944	534,365	15,840	451,642	249,519	58,836
PA	316,775	112,470	304,147	73,225	395,138	78,572	84,934
RI	13,972	3,964	8,833	3,435	9,085	2,229	249
SC	193,130	38,812	310,195	37,027	276,011	60,482	46,608
SD	24,196	9,344	103,680	11,969	286,838	57,040	104,689
TN	168,932	64,705	168,053	38,489	235,634	55,079	36,785
TX	840,340	481,953	968,412	143,317	2,327,381	362,786	418,796
UT	87,757	21,320	168,510	3,525	125,052	32,625	27,233
VT	18,050	3,893	51,409	6,392	57,738	11,627	6,846
VA	223,340	93,950	265,665	134,249	760,030	159,147	53,358
WA	182,823	104,701	320,659	23,303	255,505	78,159	46,334
WV	67,537	47,904	84,150	23,646	119,450	27,036	17,611
WI	257,009	50,144	253,218	11,781	308,418	74,178	106,703
WY	26,470	21,093	161,386	8,194	295,097	46,212	21,061
National	**9,715,575**	**3,725,010**	**15,451,487**	**1,941,752**	**19,015,260**	**4,166,547**	**3,986,783**

Table A-36. State Totals – State Emissions Summary (tons per year) Year = 1990							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	591,619	391,589	3,731,323	214,653	538,016	174,865	78,904
AZ	353,190	315,204	2,791,766	81,267	334,275	122,195	41,481
AR	265,057	223,029	1,680,562	46,188	362,880	96,792	123,066
CA	2,364,794	1,742,711	15,936,496	193,721	1,518,873	483,813	165,789
CO	368,141	254,115	2,822,500	107,564	406,937	136,589	71,318
CT	387,855	170,284	1,799,363	41,368	123,329	47,389	9,496
DE	82,578	71,477	447,245	52,670	29,278	12,708	12,970
DC	25,414	18,732	157,872	8,632	11,532	3,346	1,172
FL	1,106,474	647,716	7,628,334	157,895	696,500	222,185	78,574
GA	652,774	489,985	4,728,049	110,906	742,757	196,704	89,982
ID	129,964	94,572	866,390	37,335	387,250	73,406	44,598
IL	913,152	798,308	5,609,674	346,436	1,036,059	285,446	161,135
IN	625,651	524,289	3,703,802	430,060	685,127	173,377	123,289
IA	305,778	276,874	1,851,648	108,265	506,525	118,501	326,678
KS	381,928	406,745	2,636,682	64,270	1,347,008	306,322	140,751
KY	458,336	360,253	2,308,303	105,895	255,060	82,879	57,872
LA	489,823	711,285	2,843,487	320,672	412,401	157,664	130,152
ME	258,957	126,253	1,151,412	84,024	168,674	120,091	9,285
MD	432,055	287,327	2,843,236	150,678	205,739	70,174	32,965
MA	538,102	314,966	2,973,340	120,152	335,297	90,850	18,763
MI	1,002,589	705,374	5,829,192	330,792	534,424	152,197	84,527
MN	572,072	408,128	3,314,034	59,419	845,574	209,623	98,510
MS	383,932	297,306	1,872,095	152,919	398,250	99,305	88,216
MO	548,478	406,991	3,447,783	174,454	993,188	187,996	164,703
MT	110,067	148,907	740,053	57,085	402,581	79,953	38,051
NE	177,878	214,803	1,103,065	27,718	481,174	93,015	172,884
NV	108,884	80,953	776,546	9,750	116,003	27,008	6,917
NH	173,498	71,367	840,620	58,582	55,003	26,525	3,631
NJ	755,796	511,597	3,557,060	214,012	267,149	93,833	21,602
NM	186,206	213,612	1,850,587	117,820	1,616,013	258,116	26,921
NY	1,927,805	865,798	7,862,697	441,043	899,054	335,047	88,702
NC	818,982	431,580	4,735,239	136,645	387,610	148,606	98,679
ND	108,107	137,739	539,564	104,792	382,518	82,960	79,050
OH	1,007,719	755,823	6,610,124	478,810	610,007	184,814	119,962
OK	389,265	410,778	2,534,840	111,217	965,711	181,170	112,654
OR	603,625	328,611	2,327,235	65,805	718,764	317,010	48,694
PA	1,020,952	853,054	6,656,538	299,263	528,525	171,231	94,265
RI	74,715	45,094	442,260	13,419	25,218	8,583	1,314
SC	500,617	281,830	2,603,798	118,523	343,545	91,012	35,478
SD	96,195	90,796	644,684	18,000	292,022	69,722	85,616
TN	648,108	462,326	3,297,643	237,380	287,329	97,440	49,101
TX	1,820,096	1,698,648	10,549,721	583,235	3,742,090	643,735	358,962
UT	184,088	151,482	1,339,629	74,343	123,442	42,204	20,838
VT	73,528	49,307	477,538	12,888	66,132	18,118	10,280
VA	739,362	503,084	4,024,002	308,755	335,402	113,209	49,329
WA	577,924	415,530	3,553,569	83,835	523,072	154,304	48,767
WV	226,912	235,917	1,264,198	103,199	118,369	39,035	17,446
WI	626,625	370,441	3,031,727	191,866	489,474	148,564	147,464
WY	85,113	165,612	587,865	57,960	474,440	69,252	18,284
National	**26,280,780**	**19,538,202**	**154,925,390**	**7,426,180**	**27,125,600**	**7,118,883**	**3,909,087**

Table A-37. State Totals without CAAA Scenario – State Emissions Summary (tons per year) Year = 2000							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	541,041	672,340	2,958,649	886,261	584,680	206,479	85,641
AZ	389,941	457,868	2,566,518	228,840	418,516	147,139	48,323
AR	268,369	270,888	1,423,931	103,635	341,354	99,284	153,064
CA	2,216,443	1,382,523	12,090,799	158,703	1,541,919	473,775	215,732
CO	389,183	430,172	2,526,945	228,888	529,630	163,382	85,351
CT	334,780	172,372	1,448,330	54,162	131,354	45,556	10,182
DE	79,098	85,877	361,066	83,913	37,162	15,683	14,217
DC	22,929	299,134	149,796	639,669	39,662	23,565	1,763
FL	1,122,837	986,322	6,545,184	1,111,906	824,238	277,205	90,021
GA	672,290	554,797	4,421,900	111,007	762,881	210,857	105,787
ID	129,072	485,691	771,012	1,389,738	396,013	94,653	61,271
IL	849,881	1,240,081	4,530,437	2,034,911	1,131,661	342,054	174,360
IN	646,351	636,067	3,375,860	583,117	696,142	181,725	129,567
IA	288,990	348,197	1,482,577	207,323	510,507	116,713	305,532
KS	351,530	823,771	2,151,192	1,274,888	1,381,378	321,038	158,353
KY	455,000	420,421	1,945,059	219,800	271,637	86,316	72,777
LA	508,343	751,576	2,645,660	381,762	453,602	173,521	156,259
ME	218,578	244,604	885,646	419,371	191,619	141,005	10,544
MD	386,713	343,817	2,300,314	265,534	239,243	77,313	33,702
MA	482,872	562,860	2,323,630	563,674	365,845	107,753	20,734
MI	995,028	749,314	4,517,008	424,658	572,132	165,757	90,581
MN	561,197	441,391	2,818,811	185,975	893,713	217,839	124,297
MS	385,935	609,676	1,484,701	906,241	405,218	121,997	100,765
MO	532,474	440,452	2,950,927	210,422	1,078,687	197,533	185,854
MT	99,912	218,853	600,683	128,095	387,786	81,248	46,462
NE	163,691	256,845	868,288	107,802	496,673	93,992	184,588
NV	121,459	139,874	790,994	69,098	162,591	39,956	8,166
NH	148,677	134,227	645,928	137,693	59,408	27,875	3,938
NJ	675,037	572,962	2,826,885	206,195	273,614	92,814	24,594
NM	171,814	377,527	1,538,229	387,458	1,552,127	269,373	40,820
NY	1,629,268	1,146,097	5,985,020	929,384	893,453	330,441	91,660
NC	882,450	579,751	4,416,716	317,729	436,627	166,827	166,419
ND	98,821	798,097	434,150	2,886,376	453,076	151,245	94,705
OH	967,505	804,875	5,561,490	397,560	643,852	194,124	139,193
OK	361,869	381,482	2,041,344	133,620	833,387	172,975	150,787
OR	551,419	792,296	1,996,717	1,253,304	726,013	373,750	55,279
PA	922,662	724,194	5,328,132	260,072	511,222	162,598	100,409
RI	65,560	185,519	343,831	234,755	47,634	24,472	1,675
SC	479,022	304,339	2,082,600	150,197	341,129	90,616	43,870
SD	85,539	400,865	513,664	776,280	310,580	85,296	98,427
TN	657,417	901,479	2,799,181	849,460	356,849	130,350	56,506
TX	1,849,521	1,909,398	8,823,589	725,320	3,545,177	662,190	419,814
UT	194,531	185,313	1,144,279	81,602	181,205	55,118	28,610
VT	63,379	176,557	353,842	240,621	76,679	28,150	10,266
VA	685,156	458,035	3,132,818	321,199	360,134	116,981	58,890
WA	513,606	798,337	2,797,522	1,276,764	545,275	176,200	52,798
WV	214,933	348,963	989,254	382,873	124,808	45,687	20,110
WI	609,528	549,291	2,857,101	393,042	506,508	151,378	133,688
WY	121,043	7,905,717	1,012,070	18,224,829	1,180,209	699,731	24,447
National	**25,162,692**	**34,461,104**	**128,560,279**	**43,545,724**	**28,804,806**	**8,431,529**	**4,490,798**

Table A-38. State Totals with CAAA Scenario – State Emissions Summary (tons per year) Year = 2000							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	447,780	519,757	2,718,336	726,371	456,220	158,820	81,664
AZ	254,894	327,397	2,249,993	86,270	294,458	108,238	43,181
AR	237,438	234,593	1,368,462	136,618	276,034	83,096	125,554
CA	1,228,122	1,211,483	9,083,715	191,456	636,670	234,740	948,207
CO	313,568	304,799	2,226,389	213,229	325,305	117,862	77,373
CT	227,458	141,628	1,135,727	40,184	54,956	20,208	8,724
DE	43,657	60,329	272,140	64,539	23,461	10,510	13,830
DC	13,321	204,527	126,375	202,947	32,048	20,890	691
FL	1,058,499	815,672	6,160,362	742,758	467,522	178,732	74,445
GA	609,136	515,104	3,909,658	138,993	676,186	164,387	97,068
ID	192,391	310,361	753,502	386,572	368,091	91,838	66,502
IL	620,262	923,563	3,614,000	964,418	786,259	204,258	120,002
IN	426,011	512,347	2,829,963	293,836	665,093	145,533	107,511
IA	213,439	324,926	1,293,769	145,319	509,336	113,585	265,817
KS	245,880	514,559	1,992,873	629,794	773,077	211,445	176,909
KY	270,544	349,149	1,680,685	182,150	250,363	67,955	56,660
LA	367,716	595,944	1,964,560	218,760	270,326	98,864	82,751
ME	148,588	148,852	671,947	259,656	92,357	47,660	10,189
MD	259,620	268,149	1,796,109	177,403	114,242	40,286	30,637
MA	328,332	429,764	1,914,989	467,017	233,517	75,932	18,130
MI	625,100	616,655	3,939,891	239,175	467,068	116,886	75,459
MN	366,620	444,134	2,434,594	149,637	782,551	163,649	105,668
MS	304,904	458,455	1,243,880	362,230	405,344	107,075	75,273
MO	385,827	438,543	2,489,234	177,078	997,174	170,522	159,982
MT	66,177	166,000	514,185	90,119	354,313	68,961	47,487
NE	104,727	230,422	785,498	129,227	467,612	83,945	176,149
NV	79,451	102,356	635,772	68,492	118,869	25,149	7,906
NH	103,652	83,589	541,357	73,978	50,343	23,931	3,463
NJ	358,296	372,402	2,406,889	92,231	85,158	36,625	22,956
NM	150,300	282,875	1,454,192	268,508	889,548	176,722	41,623
NY	1,115,247	831,980	5,130,439	729,822	490,816	171,962	81,434
NC	607,320	497,737	3,699,092	254,281	326,366	114,033	169,494
ND	47,591	533,813	392,496	1,330,018	495,314	152,912	72,385
OH	617,885	693,059	4,294,370	271,367	511,012	128,351	126,569
OK	359,544	378,627	1,919,883	81,998	729,948	142,217	120,930
OR	518,732	482,615	1,609,345	778,352	598,707	304,287	58,786
PA	592,615	590,192	3,967,805	178,308	430,118	106,823	91,989
RI	35,389	91,922	282,103	248,550	29,111	18,830	1,155
SC	364,408	274,489	1,899,134	105,210	294,767	71,685	43,902
SD	55,264	218,916	453,087	408,996	312,218	81,387	103,252
TN	412,916	613,083	2,454,626	768,481	314,496	117,914	44,356
TX	1,466,910	1,696,913	7,748,395	464,462	2,445,565	426,046	412,010
UT	141,225	134,581	991,447	19,894	105,559	33,841	29,111
VT	42,562	110,046	326,820	235,711	70,875	24,068	9,750
VA	438,865	408,906	2,678,390	239,151	770,821	177,854	57,002
WA	335,516	612,725	2,162,169	827,608	323,800	114,429	50,314
WV	122,236	245,938	764,644	252,908	129,226	39,861	18,940
WI	446,375	403,713	2,249,596	166,682	324,447	93,037	127,333
WY	105,687	4,589,418	986,940	10,862,926	1,145,883	671,903	23,552
National	**17,877,998**	**25,317,008**	**108,219,827**	**26,143,691**	**21,772,554**	**6,159,746**	**4,764,073**

Table A-39. State Totals without CAAA Scenario – State Emissions Summary (tons per year) Year = 2010							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	560,145	700,592	2,959,984	909,820	527,902	202,152	93,061
AZ	476,287	526,827	2,951,908	244,592	449,184	159,439	58,258
AR	305,131	313,900	1,522,261	181,656	331,263	102,114	166,662
CA	2,583,166	1,566,605	13,539,649	201,040	1,671,953	511,358	252,396
CO	445,905	443,558	2,700,963	233,693	560,561	170,859	80,217
CT	333,983	170,760	1,483,667	66,172	130,942	43,788	10,082
DE	89,917	97,179	400,302	103,199	40,523	17,292	15,858
DC	22,184	17,142	110,964	10,819	14,049	3,829	1,685
FL	1,308,661	1,078,947	7,385,695	828,518	862,819	283,836	98,418
GA	782,698	953,457	4,894,642	1,165,877	827,456	262,428	120,980
ID	145,111	109,923	853,665	60,412	348,019	78,593	78,338
IL	905,392	1,139,814	4,620,211	1,745,186	1,068,112	310,617	188,403
IN	699,469	1,130,892	3,408,697	2,219,889	758,782	224,811	138,885
IA	306,007	394,262	1,472,090	336,339	492,538	112,885	316,807
KS	365,430	463,963	2,109,602	161,507	1,338,840	291,658	162,504
KY	509,979	890,691	2,044,948	1,385,833	283,723	109,701	81,687
LA	561,392	838,059	2,744,023	650,402	452,402	179,946	159,519
ME	208,052	118,051	854,354	117,053	170,886	120,803	10,798
MD	425,941	447,983	2,507,653	506,304	267,478	97,548	36,157
MA	494,483	383,923	2,336,152	232,371	340,387	86,871	22,098
MI	1,079,076	949,794	4,622,521	833,291	593,305	174,782	95,240
MN	618,059	527,225	2,923,133	180,506	917,094	231,850	129,043
MS	409,947	373,858	1,406,934	266,556	325,128	91,725	114,614
MO	564,872	739,523	2,983,216	905,125	1,128,097	218,532	192,469
MT	110,805	194,682	639,271	82,174	361,679	82,225	47,479
NE	174,084	260,613	867,373	107,618	489,682	88,858	185,246
NV	148,682	189,644	950,619	96,354	180,240	46,335	8,875
NH	146,701	116,228	669,167	190,620	58,310	24,792	3,907
NJ	730,932	581,357	3,001,547	247,028	274,885	91,612	26,793
NM	190,599	375,570	1,574,836	216,244	1,425,016	249,765	50,341
NY	1,571,867	900,715	5,919,228	628,138	879,519	305,455	91,500
NC	1,004,362	974,993	4,858,718	865,280	483,856	200,788	187,668
ND	102,985	243,847	420,912	324,800	348,396	74,948	94,859
OH	1,036,723	1,424,172	5,538,738	3,178,639	708,592	258,821	146,856
OK	409,585	481,797	2,103,258	279,006	778,514	176,621	160,474
OR	561,074	367,322	2,179,538	93,316	626,515	312,119	59,569
PA	1,001,188	1,261,730	5,513,420	1,477,819	580,886	230,118	104,715
RI	71,668	39,722	360,862	12,088	28,241	8,980	1,872
SC	536,990	479,504	2,257,066	393,143	366,621	110,223	50,085
SD	88,030	106,699	507,079	67,264	276,133	62,138	102,224
TN	713,516	812,532	2,820,962	1,004,569	325,517	120,580	59,794
TX	2,103,023	2,399,670	9,669,925	1,417,669	3,408,528	676,758	445,051
UT	232,341	282,598	1,289,877	128,717	210,335	66,648	31,233
VT	65,146	46,446	352,662	18,996	61,086	14,991	9,017
VA	765,274	622,052	3,355,340	531,546	388,608	134,557	62,097
WA	564,647	419,428	3,031,970	147,146	523,616	151,690	53,873
WV	243,536	691,624	990,370	1,333,364	155,152	69,787	20,553
WI	631,278	620,225	2,948,018	616,426	493,681	146,966	122,701
WY	92,520	286,803	547,007	219,735	377,062	67,502	21,949
National	**27,498,843**	**28,556,904**	**135,204,995**	**27,223,859**	**27,712,116**	**7,860,696**	**4,772,909**

Table A-40. State Totals with CAAA Scenario – State Emissions Summary (tons per year) Year = 2010							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	393,461	309,433	2,225,011	553,027	413,401	149,419	88,972
AZ	215,679	249,878	2,065,593	86,311	302,396	110,915	52,537
AR	219,573	165,322	1,130,024	131,995	273,150	81,873	138,820
CA	868,447	973,591	6,283,312	160,754	616,435	231,630	1,090,257
CO	296,747	241,348	1,960,323	187,634	320,600	114,800	73,219
CT	189,143	87,298	900,951	26,286	53,106	18,600	8,836
DE	34,295	45,099	235,653	68,183	25,246	11,068	14,911
DC	7,327	8,650	63,060	1,968	6,857	1,412	414
FL	872,526	538,253	5,538,928	329,516	468,546	168,977	81,311
GA	549,262	463,290	3,186,204	565,006	709,682	191,746	110,118
ID	215,328	98,434	690,862	22,618	321,887	74,748	79,405
IL	504,207	497,281	2,852,856	326,453	699,090	161,122	127,678
IN	361,342	417,099	2,202,608	489,607	663,554	159,244	114,827
IA	176,268	229,338	1,003,100	230,987	492,373	109,540	282,517
KS	212,308	317,777	1,728,595	133,153	734,283	185,062	183,500
KY	223,744	310,042	1,332,847	425,564	266,973	87,788	61,228
LA	340,730	542,620	1,641,665	322,995	273,348	102,043	92,670
ME	125,995	61,374	502,194	38,808	73,744	29,868	10,705
MD	213,293	165,788	1,537,675	136,694	119,216	42,188	32,674
MA	244,111	194,030	1,420,825	92,334	207,305	55,048	19,302
MI	501,147	469,723	3,081,227	515,798	463,297	118,631	78,910
MN	299,848	364,192	1,997,438	142,282	786,631	161,336	111,636
MS	246,296	227,643	909,055	139,431	339,296	77,679	82,804
MO	315,606	352,463	1,962,420	445,588	1,051,480	193,002	169,037
MT	57,606	139,901	450,605	41,693	328,671	67,628	48,603
NE	83,027	180,328	612,921	129,445	461,622	77,373	175,974
NV	61,005	120,085	602,703	46,860	128,037	27,244	8,617
NH	85,110	45,959	445,888	18,509	47,820	20,418	3,611
NJ	236,696	202,744	1,806,820	84,236	79,917	32,133	24,937
NM	130,217	236,801	1,264,753	110,246	793,192	170,026	47,726
NY	901,011	486,577	3,863,895	287,307	452,654	148,101	82,199
NC	526,410	341,819	3,039,395	340,967	351,456	129,452	184,173
ND	35,028	177,572	307,852	265,941	403,527	82,871	70,995
OH	497,007	507,620	3,282,994	428,310	517,898	140,981	133,043
OK	316,727	365,438	1,611,429	188,428	722,866	149,781	131,303
OR	517,799	234,507	1,558,641	30,744	506,316	257,170	62,390
PA	471,098	489,682	3,000,316	432,626	458,664	137,883	95,438
RI	24,462	20,059	212,943	5,610	9,472	3,137	1,309
SC	289,258	223,246	1,562,514	269,345	311,833	86,069	49,891
SD	43,292	69,555	364,978	26,024	280,206	59,402	103,222
TN	325,571	296,049	1,796,365	355,070	285,355	101,751	45,677
TX	1,305,074	1,444,614	6,799,353	790,016	2,457,608	445,182	432,706
UT	128,583	160,394	898,085	68,032	120,708	39,955	30,320
VT	33,284	18,473	229,357	7,172	56,763	12,165	8,718
VA	362,259	327,989	2,201,868	354,246	788,986	188,178	62,904
WA	281,427	275,709	1,874,352	56,525	270,805	86,034	52,831
WV	105,229	182,820	620,089	304,535	154,310	56,957	19,512
WI	392,148	278,070	1,887,492	235,485	313,962	92,897	120,187
WY	61,660	153,440	422,726	121,256	373,525	62,770	20,908
National	**14,897,668**	**14,309,417**	**87,170,760**	**10,571,619**	**20,358,067**	**5,313,298**	**5,123,480**

Table A-41. State Totals without CAAA Scenario – State Emissions Summary (tons per year) Year = 2020							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	620,069	750,528	3,200,460	908,457	506,337	206,250	104,158
AZ	611,887	633,853	3,600,059	261,598	520,181	180,530	69,563
AR	366,950	367,003	1,775,385	289,077	345,668	111,311	186,391
CA	3,222,140	1,880,951	16,515,911	228,661	2,011,258	618,502	292,557
CO	557,695	513,541	3,198,392	241,850	682,926	200,373	85,656
CT	376,384	191,631	1,694,124	69,008	148,371	48,174	10,834
DE	106,799	110,198	479,279	112,674	46,941	19,431	18,557
DC	25,266	20,843	123,797	12,588	17,489	5,185	2,069
FL	1,591,660	1,268,387	8,974,832	862,954	978,288	319,819	110,509
GA	945,921	1,085,981	5,882,500	1,197,602	867,290	286,165	138,046
ID	178,648	131,319	1,028,356	75,059	332,902	85,924	92,626
IL	1,034,228	1,234,153	5,197,551	1,661,368	1,155,397	336,152	209,476
IN	804,710	1,191,711	3,804,054	2,073,260	807,138	236,545	153,706
IA	343,797	422,619	1,615,318	344,566	515,776	117,512	337,211
KS	407,306	497,447	2,273,179	169,338	1,375,963	299,454	167,347
KY	577,723	940,088	2,287,844	1,422,887	286,676	113,615	86,923
LA	662,299	1,045,185	3,193,211	1,127,122	504,877	206,016	183,975
ME	227,279	124,749	927,251	115,583	175,952	121,849	11,596
MD	506,267	523,131	2,976,646	531,478	321,079	117,724	40,337
MA	566,856	427,777	2,670,349	228,379	367,906	93,293	24,372
MI	1,240,500	1,046,859	5,234,820	888,896	649,328	192,847	101,529
MN	708,466	576,881	3,317,350	201,191	976,877	246,766	133,174
MS	458,679	399,965	1,491,712	259,988	292,779	91,059	123,129
MO	642,582	792,131	3,353,418	888,419	1,206,008	232,586	200,419
MT	130,564	218,647	742,942	93,603	348,294	85,977	49,227
NE	195,362	276,014	962,834	110,646	513,648	92,494	192,475
NV	191,124	226,900	1,233,763	100,599	219,222	56,899	9,897
NH	164,238	127,198	780,017	173,954	63,468	25,933	4,096
NJ	847,635	644,356	3,476,254	275,503	300,445	98,854	29,706
NM	227,477	427,303	1,795,909	248,217	1,309,654	243,516	55,404
NY	1,696,175	971,734	6,572,632	655,462	921,593	317,577	94,414
NC	1,202,735	1,086,821	5,784,575	889,712	545,188	223,233	212,792
ND	112,135	252,312	458,669	330,907	359,696	76,503	96,255
OH	1,182,645	1,509,206	6,084,028	3,190,868	764,252	275,138	158,401
OK	491,190	535,454	2,409,300	288,275	770,103	183,674	173,894
OR	643,373	426,302	2,667,789	95,792	622,018	329,048	62,623
PA	1,150,948	1,343,055	6,127,136	1,578,344	606,238	240,369	110,587
RI	84,293	44,993	417,053	12,795	31,939	9,863	2,167
SC	635,128	538,977	2,675,057	407,836	379,960	118,179	56,254
SD	97,096	112,464	553,935	68,132	287,919	63,969	104,916
TN	810,158	868,525	3,210,078	1,034,312	343,128	128,148	63,519
TX	2,522,013	2,704,583	11,695,743	1,555,808	3,469,231	724,161	471,934
UT	291,170	328,785	1,588,425	138,076	266,840	81,786	33,006
VT	74,913	51,498	406,290	19,724	64,300	15,676	8,182
VA	905,891	702,804	3,973,864	547,718	432,287	149,950	69,596
WA	684,176	496,267	3,689,712	163,569	606,868	176,572	57,022
WV	284,382	718,556	1,065,833	1,358,624	159,657	72,899	21,830
WI	718,068	682,483	3,352,682	639,194	528,277	161,830	118,070
WY	107,185	311,001	612,271	227,827	315,649	63,436	23,594
National	**32,234,185**	**31,783,168**	**157,152,586**	**28,377,502**	**29,323,282**	**8,502,765**	**5,164,019**

Table A-42. State Totals with CAAA Scenario – State Emissions Summary (tons per year) Year = 2020							
State	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**
AL	382,250	255,790	2,147,401	387,691	372,486	142,928	99,789
AZ	212,674	175,421	2,140,424	88,404	326,595	115,160	63,277
AR	231,666	128,779	1,123,858	75,366	271,038	83,791	156,442
CA	873,491	740,454	6,013,700	174,613	628,397	239,309	1,296,372
CO	312,598	193,943	2,003,204	154,098	365,003	136,332	78,021
CT	178,695	54,905	850,791	26,421	54,558	16,630	9,267
DE	32,515	38,041	232,490	53,427	27,186	11,288	17,453
DC	6,313	5,394	56,335	2,079	7,814	1,542	441
FL	896,804	389,890	5,775,932	333,391	490,310	175,767	91,508
GA	578,041	317,550	3,199,489	299,861	708,941	189,899	127,936
ID	260,784	90,279	724,791	31,310	297,362	78,227	94,700
IL	496,514	373,693	2,622,007	330,027	727,484	163,190	140,935
IN	367,462	304,486	2,063,514	459,035	686,967	156,935	128,074
IA	168,418	183,783	927,629	234,756	512,352	111,631	302,394
KS	206,659	229,534	1,707,110	113,353	767,057	189,157	192,863
KY	210,248	225,710	1,251,106	296,052	259,955	82,426	65,722
LA	354,708	514,628	1,631,533	332,274	282,457	107,403	106,578
ME	108,652	50,726	478,525	39,905	75,433	29,055	11,431
MD	211,230	117,608	1,561,646	105,852	128,588	41,635	36,379
MA	228,259	133,720	1,361,782	92,471	214,059	53,776	20,768
MI	457,808	376,952	2,834,768	410,186	485,295	118,343	83,240
MN	258,247	305,084	1,855,857	137,171	823,191	165,260	119,855
MS	243,713	166,272	825,859	77,315	306,323	74,317	91,859
MO	304,270	279,503	1,850,118	466,078	1,110,930	199,757	182,467
MT	54,552	124,378	451,399	45,358	307,063	67,544	50,807
NE	76,981	145,077	571,584	99,693	482,778	79,511	183,357
NV	58,956	83,667	628,336	44,478	148,626	31,158	9,649
NH	74,663	33,901	438,588	18,872	50,050	20,217	3,734
NJ	213,106	137,675	1,720,011	70,519	80,522	29,800	27,261
NM	131,595	217,588	1,266,197	118,877	686,220	176,511	52,628
NY	819,936	337,064	3,697,699	231,511	433,083	130,989	82,341
NC	531,889	234,825	3,034,433	161,224	381,343	137,844	208,921
ND	28,934	127,393	279,272	237,996	413,511	82,969	72,059
OH	481,694	375,473	3,049,494	338,896	541,690	139,132	144,543
OK	303,776	292,504	1,601,273	121,940	706,071	152,823	142,233
OR	548,154	195,373	1,668,070	33,001	468,580	265,212	66,347
PA	454,733	362,158	2,815,574	298,234	454,812	127,011	100,423
RI	22,877	11,871	199,596	5,650	10,158	3,103	1,471
SC	298,439	177,581	1,569,866	209,638	314,005	91,066	56,200
SD	38,068	38,677	338,520	18,340	290,042	59,927	105,901
TN	309,093	209,783	1,680,974	224,314	289,158	100,383	48,541
TX	1,278,316	1,205,070	6,846,220	798,423	2,441,744	453,032	459,033
UT	131,040	124,073	912,351	53,296	144,649	44,365	31,955
VT	28,291	10,323	218,148	7,508	58,574	12,273	7,860
VA	358,896	273,077	2,184,872	290,901	798,888	192,814	71,925
WA	269,407	212,941	1,933,447	62,970	272,930	90,409	56,368
WV	105,798	146,306	635,450	200,480	153,559	52,715	20,841
WI	372,605	201,057	1,777,621	225,818	342,299	104,957	115,177
WY	63,414	114,404	416,584	102,300	308,834	56,800	22,612
National	**14,637,234**	**11,044,382**	**85,175,445**	**8,741,374**	**20,508,969**	**5,386,322**	**5,659,956**

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APPENDIX B

IPM-CEM EMISSIONS COMPARISON

To assess the accuracy of IPM's with-CAAA emissions estimates for 2001, the project team compared these estimates to 2001 continuous emission monitoring (CEM) data from EPA's Emission Tracking System (ETS). To conduct this analysis, the project team matched units included in IPM with the corresponding units in ETS based on their Office of Regulatory Information Systems (ORIS) identification number and boiler number. Of the 8,104 units in IPM, the project team identified matches in ETS for 1,918, slightly less than 25 percent. The estimated heat input of these 1,918 units, however, represents approximately 88 percent of the heat input modeled in IPM for the 2001 with-CAAA scenario.

Because the 2001 IPM run was constrained to reflect total emissions in 2001, IPM's 2001 with-CAAA emissions estimates for matching units are similar to the ETS emissions data. At the unit level, however, we found significant differences. Among matching units, we estimate a median difference of 430 tons between IPM's SO_2 emissions estimates and the estimates included in ETS. This represents approximately 28 percent of the SO_2 emissions generated among the median EGU. Similarly, we estimate that the median difference IPM and ETS estimates of NO_x emissions is 270 tons, or 28 percent of the NO_x emissions generated by the typical electric generating unit.

The magnitude of the unit-level statistics presented above suggests that the spatial distribution of emissions in IPM may be different than the actual distribution reflected in the ETS data. To examine the spatial distribution of emissions in IPM relative to the ETS data, we developed two estimates of total SO_2 and NO_x emissions for each state in 2001--one based on IPM's unit-level estimates and a second based on the 2001 ETS data. For each state (and pollutant), we then calculated the difference between IPM's estimates and the ETS data.

Exhibits B-1 through B-3 summarize the results of our comparative analysis. Exhibit B-1 suggests that IPM underestimates SO_2 emissions throughout most of the Southeast and Appalachia for 2001. In contrast, IPM's SO_2 estimates exceed the corresponding ETS values for the West Coast and most of the Northeast. As indicated in Exhibit B-2, IPM exhibits a different pattern for NO_x emissions in 2001. Compared to the model's estimation of SO_2 emissions, IPM is not as consistent in its overestimation or underestimation of NO_x emissions for the eastern half of the country. Similar to SO_2, however, Exhibit B-2 suggests that IPM underestimates NO_x emissions in Michigan, Ohio, and West Virginia—three states whose emissions significantly affect air quality in heavily populated areas in the Northeast. Throughout most of the Rockies and the Northern Plains the difference between the ETS data and IPM's estimates suggests that IPM overestimates NO_x emissions in this region.

EXHIBIT B-1

COMPARISON OF IPM AND CEM ESTIMATES OF SO_2 EMISSIONS IN 2001 BY STATE

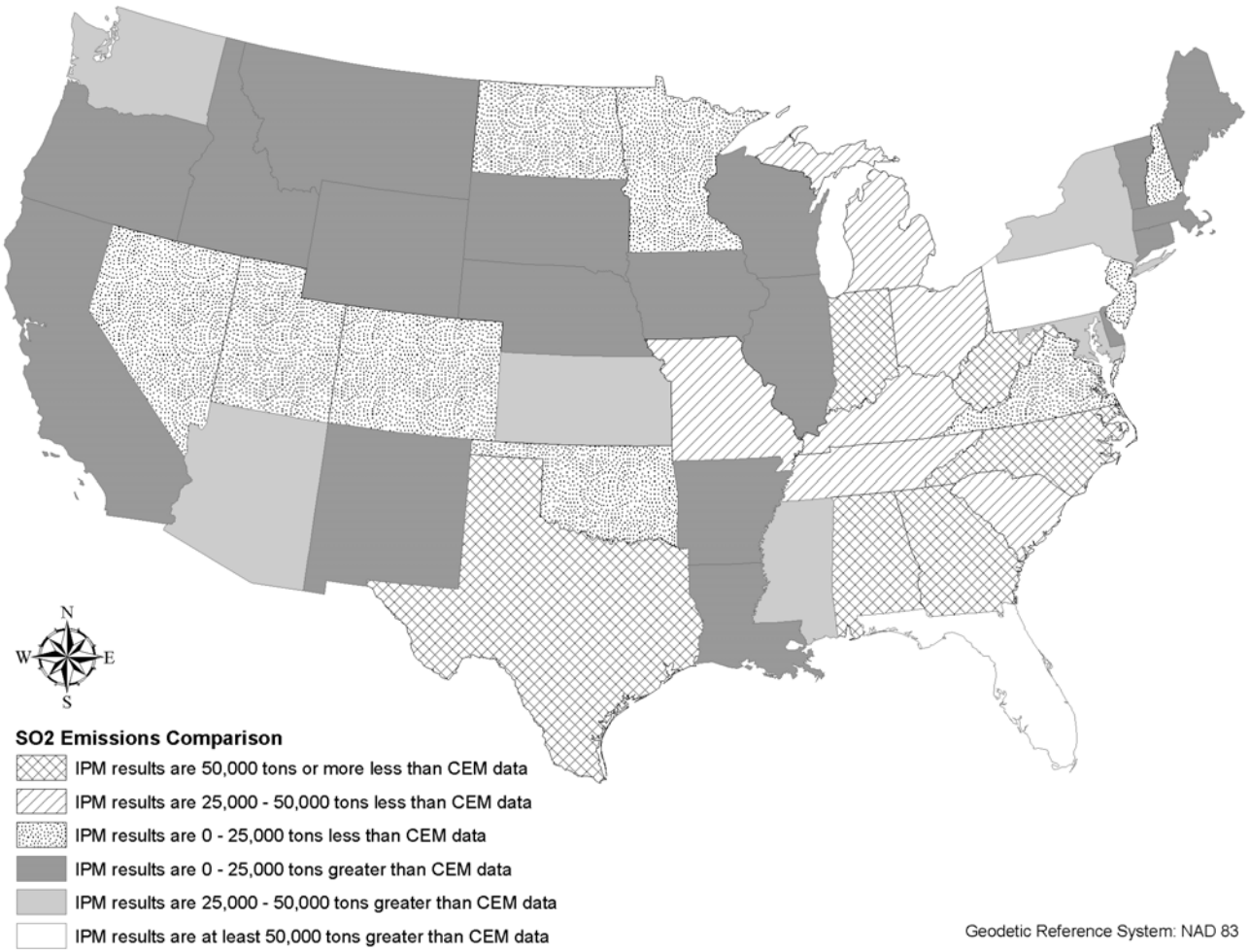


EXHIBIT B-2

COMPARISON OF IPM AND CEM ESTIMATES OF NO_x EMISSIONS IN 2001 BY STATE

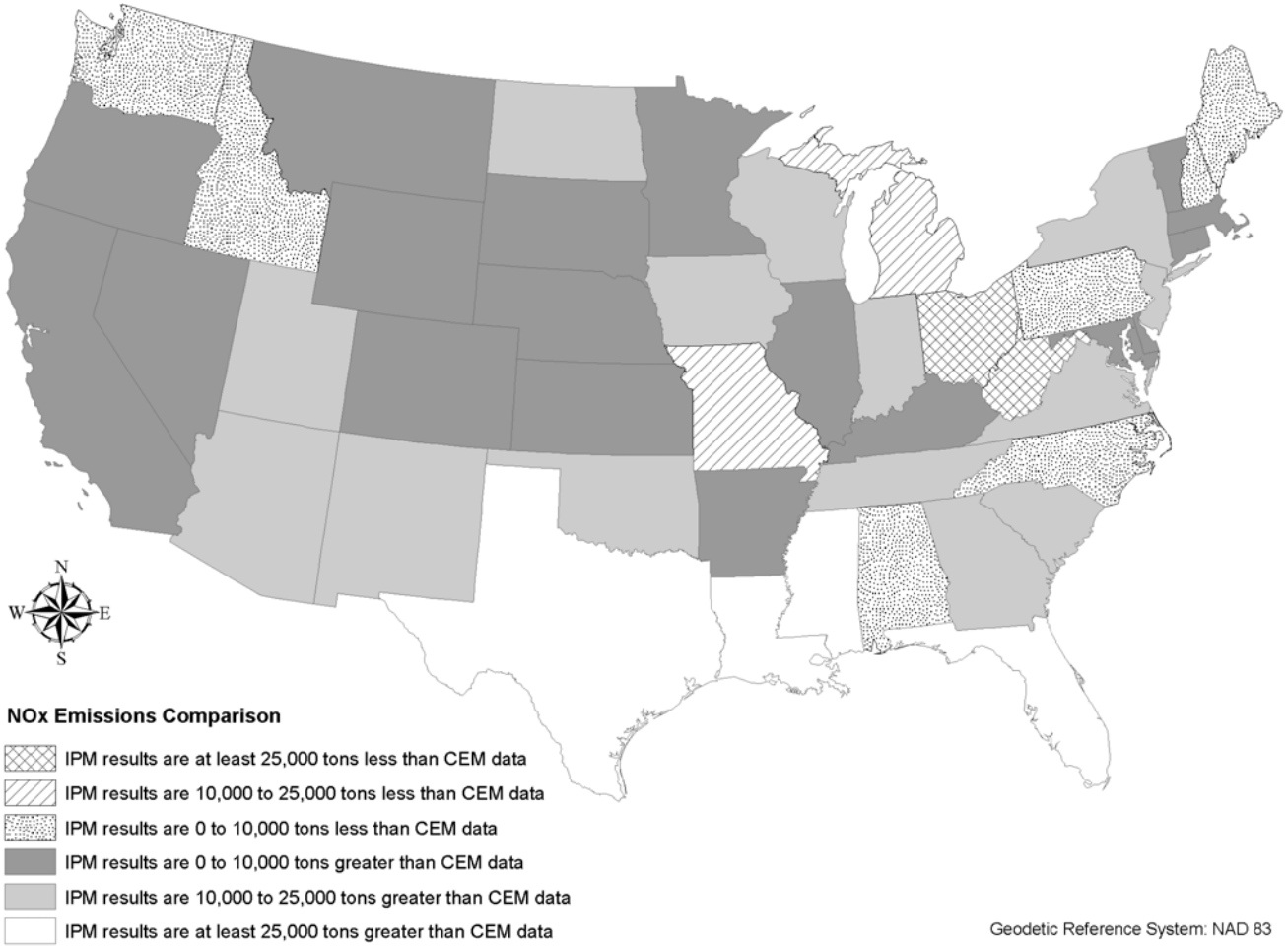


EXHIBIT B-3

COMPARISON OF CEM/ETS AND IPM EMISSIONS ESTIMATES FOR 2001

State	SO_2 Emissions: CEM/ETS (tons)	SO_2 Emissions: IPM (tons)	Difference between CEM/ETS and IPM SO_2 Emissions (tons)*	NO_x Emissions: CEM/ETS (tons)	NO_x Emissions: IPM (tons)	Difference between CEM/ETS and IPM NO_x Emissions (tons)*
Alabama	465,846	559,925	-94,079	166,608	166,809	-201
Arizona	73,325	47,637	25,688	93,019	74,008	19,011
Arkansas	78,199	77,159	1,040	47,192	40,317	6,876
California	1,868	0	1,868	18,429	14,520	3,909
Colorado	88,595	108,683	-20,088	68,836	65,313	3,523
Connecticut	34,121	15,227	18,894	10,855	4,585	6,270
Delaware	34,879	13,531	21,348	10,502	9,743	759
Dist. of Columbia	754	0	754	235	0	235
Florida	462,201	188,230	273,970	238,324	170,522	67,802
Georgia	485,843	573,170	-87,326	160,742	149,563	11,179
Idaho	3	0	3	157	412	-255
Illinois	368,039	358,126	9,913	199,341	192,932	6,409
Indiana	731,531	828,617	-97,086	299,977	283,214	16,763
Iowa	133,540	111,763	21,777	78,469	62,657	15,813
Kansas	120,001	77,691	42,310	84,477	82,132	2,345
Kentucky	535,444	567,004	-31,559	231,729	222,523	9,206
Louisiana	112,798	97,429	15,369	80,459	44,257	36,201
Maine	6,797	0	6,797	1,610	2,844	-1,234
Maryland	250,205	224,518	25,687	70,119	65,446	4,672
Massachusetts	102,906	91,182	11,723	30,630	28,127	2,503
Michigan	347,058	381,364	-34,306	141,117	153,474	-12,357
Minnesota	91,536	97,075	-5,539	80,293	77,717	2,576
Mississippi	138,344	91,061	47,283	57,234	30,153	27,080
Missouri	231,561	279,465	-47,904	144,715	165,922	-21,207
Montana	24,403	17,824	6,578	39,435	35,476	3,959
Nebraska	70,250	68,290	1,960	47,883	45,317	2,565
Nevada	54,694	73,684	-18,990	43,549	41,293	2,256
New Hampshire	48,127	50,452	-2,325	6,796	7,139	-343
New Jersey	50,209	60,014	-9,805	25,903	12,399	13,504
New Mexico	62,191	51,782	10,409	83,080	72,085	10,995
New York	248,912	204,685	44,226	73,839	61,795	12,044
North Carolina	448,948	510,868	-61,920	143,363	153,186	-9,823
North Dakota	154,934	164,566	-9,632	79,114	59,721	19,393
Ohio	1,114,751	1,150,358	-35,608	330,459	395,423	-64,964
Oklahoma	101,436	121,139	-19,703	83,154	73,115	10,038
Oregon	17,824	9,857	7,967	10,846	7,573	3,272
Pennsylvania	931,149	712,849	218,300	200,277	202,136	-1,859

EXHIBIT B-3

COMPARISON OF CEM/ETS AND IPM EMISSIONS ESTIMATES FOR 2001

State	SO_2 Emissions: CEM/ETS (tons)	SO_2 Emissions: IPM (tons)	Difference between CEM/ETS and IPM SO_2 Emissions (tons)*	NO_x Emissions: CEM/ETS (tons)	NO_x Emissions: IPM (tons)	Difference between CEM/ETS and IPM NO_x Emissions (tons)*
South Carolina	196,030	241,161	-45,130	79,923	57,179	22,744
South Dakota	13,618	9,563	4,055	16,489	12,934	3,554
Tennessee	356,587	392,933	-36,346	154,737	142,495	12,242
Texas	541,335	629,959	-88,625	303,245	207,001	96,244
Utah	28,321	48,306	-19,985	71,510	57,889	13,621
Vermont	5	0	5	229	0	229
Virginia	200,215	215,892	-15,677	73,457	63,089	10,368
Washington	66,910	29,837	37,073	18,330	22,915	-4,585
West Virginia	497,336	767,775	-270,439	203,319	279,523	-76,205
Wisconsin	175,395	174,019	1,376	98,471	86,149	12,322
Wyoming	84,467	80,612	3,855	84,251	78,435	5,816

* Positive values indicate that the CEM/ETS emissions values are greater than IPM's emissions estimates.

Exhibits B-1 and B-2 clearly demonstrate that IPM's spatial distribution of with-CAAA emissions in 2001 is different than the actual distribution of emissions. Although this represents a limitation of IPM, we believe it is appropriate to use IPM's with-CAAA emissions estimates for 2001 rather than the ETS data. Because the purpose of the Second Prospective is to compare the with-CAAA scenario to the without-CAAA counterfactual, it is important that the methodology for measuring emissions and the spatial distribution of emissions is consistent across the two scenarios. While the IPM estimates for the with-CAAA and without-CAAA scenarios are methodologically consistent, it is not possible to develop without-CAAA emissions estimates consistent with the ETS data. Therefore, we do not think it would be appropriate to use the ETS data for the primary emissions estimates for the Second Prospective. Instead, it may be more appropriate to use these data for a sensitivity analysis.

APPENDIX C

OTHER IPM RESULTS

As indicated above, to estimate utility emissions under the with-CAAA and without-CAAA scenarios, IPM simulates the operation of the utility sector in significant detail. Therefore, the model generates a number of outputs in addition to emissions. Exhibit C-1 summarizes IPM's estimates of generating capacity by fuel type under the with-CAAA and without-CAAA scenarios for the years 2001, 2010, and 2020. For 2001, the mix of generating capacity is the same under both scenarios because the project team constrained the model to reflect the generating capacity that was in place in 2001. The results for 2010 and 2020 suggest that coal-fired capacity would be higher if the Amendments had not been enacted and that the Amendments have had a positive impact on natural gas and renewables capacity.

EXHIBIT C-1

SUMMARY OF IPM CAPACITY ESTIMATES BY FUEL TYPE (MW)

Fuel Type	2001 without-CAAA	2001 with-CAAA	2010 without-CAAA	2010 with-CAAA	2020 without-CAAA	2020 with-CAAA
Coal	303,103	303,104	302,530	299,579	316,300	307,910
Hydro	109,292	109,291	109,643	109,643	109,643	109,643
Nuclear	99,036	99,036	100,819	100,819	102,862	102,862
Oil/Natural Gas	294,084	294,082	398,904	398,755	504,214	512,126
Other	9,337	9,337	10,448	10,448	10,448	10,448
Renewables	8,297	8,297	13,622	13,636	14,366	14,485
TOTAL	823,149	823,147	935,966	932,880	1,057,833	1,057,474

Similar to capacity, the composition of generation under the with-CAAA scenario is different than that under the without-CAAA scenario. Unlike capacity, however, the fuel mix for generation differs for all three target years rather than just for 2010 and 2020. Although IPM was constrained to hold capacity constant under both regulatory scenarios for 2001, the model was free to simulate 2001 dispatch subject to the constraints included in each scenario. Therefore, as indicated in Exhibit C-2, IPM estimates that coal-based and hydroelectric generation in 2001 are higher under the without-CAAA scenario than under the with-CAAA scenario, while generation by natural gas/oil is greater under the with-CAAA scenario. The model produced similar results for 2010 and 2020.

EXHIBIT C-2

SUMMARY OF IPM GENERATION ESTIMATES (GWh)

Fuel Type	2001 without-CAAA	2001 with-CAAA	2010 without-CAAA	2010 with-CAAA	2020 without-CAAA	2020 with-CAAA
Coal	2,027,224	2,022,124	2,217,517	2,181,797	2,348,733	2,268,011
Hydro	229,240	224,937	296,040	290,156	291,754	288,350
Nuclear	759,472	759,472	796,479	796,479	808,378	808,379
Oil/Natural Gas	535,343	538,704	883,598	916,801	1,414,317	1,492,428
Other	48,205	48,205	44,780	44,737	50,023	50,023
Renewables	39,664	40,040	58,364	58,865	62,297	63,241
TOTAL	3,639,148	3,633,483	4,296,778	4,288,835	4,975,502	4,970,432

In addition to capacity and generation by fuel type, IPM also estimates energy prices and allowance prices for each target year, as summarized in Exhibit C-3. As indicated by these results, IPM estimates that the Amendments have increased electricity prices relative to prices under the without-CAAA scenario. Because the Amendments have increased the cost of producing electricity, the project team expected this result. For 2010 and 2020, IPM's results also suggest that natural gas prices are higher under the with-CAAA scenario than under the without-CAAA scenario. This is consistent with the utility sector's higher demand for natural gas under the with-CAAA scenario relative to the without-CAAA scenario as indicated in Exhibit C-2. In contrast to natural gas, IPM estimates that coal prices are lower under the with-CAAA scenario in 2001 and 2010 than under the without-CAAA scenario. This likely reflects the shift away from coal-based generation projected to occur under the Amendments, as shown above in Exhibit C-2. For 2020, however, IPM estimates that coal prices are higher under the with-CAAA scenario than under the without-CAAA scenario. This reflects differences in the types of coal purchased by utilities between the with-CAAA and without-CAAA scenarios.

Exhibit C-3 indicates that allowance prices for NO_x fall significantly between 2001 and 2010. This reduction reflects the differences between the regulation of NO_x in 2001 and 2010. The 2001 estimate reflects the Ozone Transport Commission (OTC) summer program for NO_x, whereas later estimates reflect NO_x SIP Call and the Clean Air Interstate Rule (CAIR). While the OTC program only affected a small group of states in the Northeast, NO_x SIP Call and CAIR affect several states in the Midwest (in addition to the Northeast), where coal-based generation is more prevalent relative to the Northeast. Because the marginal cost of controlling NO_x is relatively low for coal-fired plants, the allowance price under NO_x SIP Call and CAIR in 2010 is lower than that associated with the OTC summer program in 2001. In addition, unlike the OTC summer program, CAIR sets an annual cap on NO_x emissions rather than a seasonal cap. Under the OTC program, the cost of implementing NO_x controls is spread over the emissions reductions achieved in the summer, while the cost of controlling NO_x emissions under CAIR is spread over the reductions achieved during the entire year. Therefore, the cost per ton of NO_x controlled (and the allowance price) is lower under CAIR in 2010 than under the OTC program in 2001.

EXHIBIT C-3

IPM ESTIMATES OF ENERGY AND ALLOWANCE PRICES

IPM Output	2001 without-CAAA	2001 with-CAAA	2010 without-CAAA	2010 with-CAAA	2020 without-CAAA	2020 with-CAAA
Minemouth Coal Prices ($/MMBtu)	$0.71	$0.68	$0.69	$0.66	$0.65	$0.66
Henry Hub Natural Gas Prices ($/MMBtu)	$2.75	$2.75	$3.40	$3.45	$3.45	$3.54
Wholesale electricity prices ($/MWh)	$24.80	$26.21	$29.64	$30.96	$35.93	$36.77
SO_2 Allowance Price ($ per allowance)	Not Applicable	$361	Not Applicable	$412	Not Applicable	$397
NO_x Allowance Price ($ per allowance)	Not Applicable	$2,490	Not Applicable	$1,184	Not Applicable	$1,394
Hg Allowance Price ($ per pound)	Not Applicable	Not Applicable	Not Applicable	$25,170	Not Applicable	$42,340

All estimates are presented in year 1999 dollars.

Exhibit C-4 compares 2001 fuel and allowance prices as estimated by IPM for the with-CAAA scenario to actual prices observed in 2001.[1] As indicated by Exhibit C-4, IPM's coal price estimate is similar to the average coal price observed in 2001, but the model overestimates allowance prices for both SO_2 and NO_x and underestimates the price of natural gas. The inconsistencies between IPM's natural gas and allowance prices and actual prices observed on the open market may affect IPM's modeling of electric utilities' investment and dispatch decisions. However, because the 2001 with-CAAA model run was constrained to reflect actual emissions in 2001, these inconsistencies may affect the spatial distribution of emissions across the U.S., but not aggregate emissions.[2] As indicated in Appendix B, the actual distribution of SO_2 and NO_x emissions across different states in 2001 was different than the distribution estimated by IPM for the 2001 with-CAAA scenario. Despite this difference, we believe it is appropriate to use the IPM with-CAAA emissions estimates for 2001 rather than the emissions data collected by EPA. To make a valid comparison between with-CAAA and without-CAAA emissions for the Second Prospective, it is important that the project team use a consistent methodology for both scenarios. Therefore, in the absence of counterfactual emissions data for the without-CAAA scenario, it is more appropriate to conduct a model-to-model comparison of IPM results for both scenarios instead of comparing 2001 emissions data to IPM's results for the without-CAAA scenario.

[1] Although Exhibit C-3 presents minemouth and Henry Hub prices for coal and natural gas, respectively, we present delivered prices in Exhibit C-4 because data for the delivered price of each fuel was more readily available than minemouth and Henry Hub data.

[2] In addition, sensitivity analyses conducted internally by EPA suggest that IPM's aggregate results are not highly sensitive to changes in natural gas prices. U.S. EPA, "Multi-pollutant Analysis: Natural Gas Price Sensitivity," April 2006, http://www.epa.gov/airmarkets/mp/.

EXHIBIT C-4

COMPARISON OF IPM PRICE ESTIMATES FOR 2001 AND ACTUAL 2001 PRICES*

Price Description	IPM Estimate: with-CAAA scenario for 2001	Observed Values for 2001
Coal Delivered to Utilities ($/MMBtu)	$1.22	$1.17[1]
Natural Gas Delivered to Utilities ($/MMBtu)	$2.93	$4.46[2]
SO_2 Allowance Price ($ per allowance)	$361	$172[3]
NO_x Allowance Price ($ per allowance)	$2,490	$860-$1,433[4]

* All values are presented in year 1999 dollars.

Sources:

1. U.S. Department of Energy, Energy Information Administration, *Annual Coal Report 2002*.
2. U.S. Department of Energy, Energy Information Administration, "Natural Gas Monthly May 2005."
3. Sales weighted average of monthly average prices reported by Cantor Fitzgerald.
4. Cantor Environmental Brokerage, "NO_x Budget Allowance MPI History" and Natsource, "Full OTC Nox Price History - Mid Market Prices."

APPENDIX D

OFFROAD AND NONROAD COMPARISON FOR CALIFORNIA

INTRODUCTION

This appendix provides additional detail on our comparison of emissions estimates from the State of California's OFFROAD model to the USEPA NONROAD model estimates for California. The Air Resources Board (ARB) has developed their own model for preparing nonroad emission inventories named OFFROAD. There is a separate model for California, in part, because California sets its own off-road equipment emission standards. For the second Section 812 Prospective, the United States Environmental Protection Agency (EPA) requested that the ARB provide OFFROAD-based inventories for both with and without Clean Air Act Amendments (CAAA) scenarios for the years of interest. However, only controlled inventories were readily available from ARB. Because OFFROAD-based emissions reflecting a without-CAAA scenario were not available, EPA NONROAD model-based emissions for California were used in the Section 812 Prospective analysis.

Past comparisons have shown that the estimates from OFFROAD for some equipment types differ significantly from NONROAD estimates, especially for volatile organic compounds (VOC) and carbon monoxide (CO). To examine the existing difference between these two nonroad emission models, results obtained from the with-CAAA NONROAD model runs for California were compared with Statewide nonroad controlled inventories (i.e., with CAAA) based on ARB's OFFROAD model. As described in Chapter 5 of this report, the Project Team compiled OFFROAD-based emission estimates for VOC, oxides of nitrogen (NO_x), CO, particulate matter less than or equal to 2.5 micrometers ($PM_{2.5}$), and sulfur dioxide (SO_2) for the years 1990, 2000, 2010, and 2020. Controlled emissions inventories for California were obtained from ARB's *Emission Inventory Data - Almanac Emission Projection Data* (ARB, 2005a).

This appendix supplements the Chapter 5 summary of this analysis with further evaluation of the results to determine what factors are causing some of the significant differences. This analysis first examines overall nonroad sector inventories, as well as the effect of categories being absent from the OFFROAD-based inventories (e.g., liquefied petroleum gasoline fueled engines). It then focuses on a subset of categories that show the most significant discrepancies, compares equipment populations, and also investigates the impact of California standards on emissions (i.e., relative to Federal standards).

In summary, discrepancies are shown to result in part from differences in equipment activity, category-specific future emission standards, and variations in fuel input data (e.g., fuel sulfur content). Some of the differences are substantial when comparing all categories combined for a given pollutant. However, one large discrepancy for the gasoline lawn and garden category is attributable to outdated data on equipment populations. When updated with new survey data from California, the difference is expected to narrow substantially. In addition, more stringent State-level fuel sulfur requirements in California than the rest of the U.S. explain the differences observed in SO_2 emission estimates. California's information on the sulfur content of off-road diesel fuel appears to be more accurate than what is in EPA's NONROAD model defaults for historical years.

OFFROAD COMPARISONS

Exhibit D-1 shows a comparison by year for total NONROAD model category emissions. ARB estimates total VOC emissions for each *with-CAAA* scenario year to be approximately 30 to 40 percent lower than EPA, and estimates CO emissions to be 50 to 75 percent lower than EPA. ARB also estimates $PM_{2.5}$ emissions to be about 10 percent lower than EPA on average for all years except 1990, which shows slightly higher $PM_{2.5}$ emissions. ARB's NO_x estimates are considerably higher in 1990 (+98 percent), and in 2000 (+45 percent), but are only about 20 percent higher than EPA for the years 2010 and 2020. Finally, ARB estimates SO_2 emissions to be 55 percent higher than EPA in 1990, and 163 percent higher in 2020. Overall, SO_2 emissions in 2000 and 2010 are much lower based on ARB's model (-93 percent and –52 percent, respectively).

Exhibit D-1. EPA and ARB Overall Nonroad Emissions Comparison - State of California

Year	Pollutant	EPA	ARB	Absolute Difference	Percent Difference
1990	VOC	270,139	191,156	-78,983	-29%
2000	VOC	237,704	171,592	-66,112	-28%
2010	VOC	158,493	104,727	-53,766	-34%
2020	VOC	142,339	84,345	-57,994	-41%
1990	NOX	164,566	325,389	160,823	98%
2000	NOX	173,505	251,607	78,102	45%
2010	NOX	146,092	177,877	31,785	22%
2020	NOX	98,241	116,505	18,264	19%
1990	CO	2,615,018	1,339,546	-1,275,472	-49%
2000	CO	2,545,659	1,105,559	-1,440,100	-57%
2010	CO	3,141,091	908,788	-2,232,303	-71%
2020	CO	3,696,579	923,533	-2,773,046	-75%
1990	PM25	21,101	22,118	1,016	5%
2000	PM25	18,692	16,738	-1,954	-10%
2010	PM25	16,240	14,287	-1,953	-12%
2020	PM25	12,142	11,254	-888	-7%
1990	SO2	13,095	20,291	7,196	55%
2000	SO2	13,849	942	-12,906	-93%
2010	SO2	1,483	715	-768	-52%
2020	SO2	296	776	481	163%

Engine Category Comparison

Exhibit D-2 compares EPA and ARB results for 2000 at an engine (i.e., fuel) category level. For all pollutants, total gasoline emissions from ARB are lower than EPA, and total diesel emissions per ARB are higher than EPA estimates. The impact these engine specific differences have on the total inventory depend on the relative contribution of the general engine category for each pollutant inventory. For example, decreases in gasoline VOC outweigh the increases in diesel VOC emissions because the gasoline engines contribute significantly more to the VOC emissions inventory than the diesel, compressed natural gas (CNG) or liquefied petroleum gas (LPG) engines. In addition, one general engine category that is absent from ARB's OFFROAD model is LPG engines. Because this category is not a

significant contributor for most pollutants (with the exception of NO_x), the exclusion of this category from OFFROAD results in minimal differences.

Exhibit D-2. EPA and ARB 2000 Year Engine-Level Emissions Comparison

Pollutant	Engine	EPA	ARB	Absolute Difference	Percent Difference
VOC	Gasoline	215,402	144,220	-71,182	-33%
VOC	Diesel	15,495	27,361	11,866	77%
VOC	CNG/LPG	6,807	11	-6,795	-100%
NOX	Gasoline	25,680	24,375	-1,305	-5%
NOX	Diesel	119,446	214,874	95,428	80%
NOX	CNG/LPG	28,379	12,358	-16,021	-56%
CO	Gasoline	2,363,666	979,198	-1,384,468	-59%
CO	Diesel	70,265	97,464	27,199	39%
CO	CNG/LPG	111,728	28,898	-82,830	-74%
PM25	Gasoline	6,630	3,512	-3,118	-47%
PM25	Diesel	11,930	13,160	1,231	10%
PM25	CNG/LPG	133	66	-67	-51%
SO2	Gasoline	1,156	479	-677	-59%
SO2	Diesel	12,662	457	-12,205	-96%
SO2	CNG/LPG	30	6	-24	-80%

Equipment Category Comparison

With some exceptions, the data reported by ARB corresponds to general equipment categories, or 7-digit EPA source classification codes (SCCs). Seven-digit SCCs are roughly equivalent to Tier 3 categories. The results of comparisons at a Tier 3 source category level are shown in Exhibits D-3 through D-7 for VOC, NO_x, CO, $PM_{2.5}$, and SO_2, respectively. Appendix A includes a correspondence table that shows the specific equipment categories reported by ARB and how they were matched to EPA Tier categories.

EPA's inclusion of three other equipment categories not covered by ARB's inventory, including gasoline and diesel railway maintenance and diesel recreational vehicles, have a small impact on total mass emissions, and as such are not contributing significantly to any observed differences.

Exhibit D-3. Comparison of EPA Section 812 and ARB VOC Emissions for California, tpy

		1990			2000			2010			2020		
TIER 2 NAME	**TIER 3 NAME**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**
Non-Road Gasoline	recreational	15,142	22,241	47%	19,483	20,605	6%	34,635	21,391	-38%	17,870	24,626	38%
	construction	8,250	2,122	-74%	4,680	1,477	-68%	2,264	976	-57%	2,438	959	-61%
	industrial	7,098	3,050	-57%	2,052	2,815	37%	548	1,140	108%	180	759	322%
	lawn & garden	144,780	78,822	-46%	114,804	57,234	-50%	60,821	29,149	-52%	70,039	26,864	-62%
	farm	327	1,170	258%	295	982	233%	189	833	341%	163	688	322%
	light commercial	27,281	8,843	-68%	18,971	6,870	-64%	11,839	4,483	-62%	14,870	3,563	-76%
	logging	569	2,417	325%	517	1,163	125%	332	538	62%	434	538	24%
	airport service	55	208	278%	34	253	647%	12	98	728%	10	69	585%
	railway maintenance	37	NA	NA	20	NA	NA	12	NA	NA	14	NA	NA
	recreational marine vessels	44,212	37,822	-14%	54,546	52,821	-3%	33,368	28,580	-14%	27,583	16,755	-39%
	Subtotal: Non-Road Gasoline	**247,752**	**156,695**	**-37%**	**215,402**	**144,220**	**-33%**	**144,019**	**87,187**	**-39%**	**133,600**	**74,821**	**-44%**
Non-Road Diesel	recreational	49	NA	NA	56	NA	NA	56	NA	NA	44	NA	NA
	construction	10,591	17,968	70%	8,939	14,043	57%	7,035	8,487	21%	4,819	5,071	5%
	industrial	2,025	3,885	92%	1,707	3,408	100%	1,032	2,499	142%	705	1,227	74%
	lawn & garden	715	477	-33%	872	334	-62%	698	183	-74%	531	3	-99%
	farm	2,068	8,959	333%	1,831	7,250	296%	1,115	4,590	312%	706	2,136	202%
	light commercial	1,481	1,773	20%	1,688	1,531	-9%	1,472	1,153	-22%	988	536	-46%
	logging	162	1,059	552%	87	427	388%	40	222	456%	21	137	558%
	airport service	157	137	-13%	135	137	1%	97	122	26%	70	81	17%
	railway maintenance	70	NA	NA	76	NA	NA	68	NA	NA	44	NA	NA
	recreational marine vessels	84	194	132%	105	232	121%	125	276	122%	124	328	164%
	Subtotal: Non-Road Diesel	**17,402**	**34,451**	**98%**	**15,495**	**27,361**	**77%**	**11,738**	**17,533**	**49%**	**8,051**	**9,520**	**18%**
Other	liquified petroleum gas	4,946	NA	NA	6,757	NA	NA	2,722	NA	NA	682	NA	NA
	compressed natural gas	40	10	-75%	50	11	-77%	14	6	-60%	6	4	-30%
	Subtotal: Other Sources	**4,986**	**10**	**-100%**	**6,807**	**11**	**-100%**	**2,736**	**6**	**-100%**	**688**	**4**	**-99%**
TOTAL: ALL SOURCES		**270,139**	**191,156**	**-29%**	**237,704**	**171,592**	**-28%**	**158,493**	**104,727**	**-34%**	**142,339**	**84,345**	**-41%**

Exhibit D-4. Comparison of EPA Section 812 and ARB NO_x Emissions for California, tpy

		1990			2000			2010			2020		
TIER 2 NAME	**TIER 3 NAME**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**
Non-Road Gasoline	recreational	457	1,191	161%	803	1,524	90%	1,115	1,792	61%	1,290	2,058	60%
	construction	437	1,096	151%	679	754	11%	464	889	91%	419	915	119%
	industrial	2,685	7,029	162%	1,686	7,265	331%	494	3,075	522%	93	2,328	2393%
	lawn & garden	6,436	2,073	-68%	14,710	2,524	-83%	11,158	3,030	-73%	12,902	2,558	-80%
	farm	82	1,201	1367%	137	821	499%	101	849	744%	84	918	994%
	light commercial	1,760	2,977	69%	4,655	2,951	-37%	4,154	3,237	-22%	4,949	3,335	-33%
	logging	10	97	910%	20	43	111%	24	61	155%	30	61	103%
	airport service	23	904	3895%	32	1,225	3775%	11	451	4158%	6	308	4923%
	railway maintenance	3	NA	NA	8	NA	NA	5	NA	NA	6	NA	NA
	recreational marine vessels	2,154	5,568	158%	2,949	7,268	146%	4,536	11,227	148%	5,678	9,452	66%
	Subtotal: Non-Road Gasoline	**14,045**	**22,135**	**58%**	**25,680**	**24,375**	**-5%**	**22,062**	**24,610**	**12%**	**25,456**	**21,934**	**-14%**
Non-Road Diesel	recreational	124	NA	NA	151	NA	NA	176	NA	NA	172	NA	NA
	construction	84,582	164,039	94%	71,672	121,026	69%	65,865	83,714	27%	34,626	51,937	50%
	industrial	15,115	27,362	81%	14,062	21,340	52%	11,969	15,774	32%	7,087	9,476	34%
	lawn & garden	3,799	2,260	-41%	5,135	2,452	-52%	6,169	531	-91%	5,674	8	-100%
	farm	12,618	72,901	478%	14,002	53,602	283%	11,969	35,101	193%	7,397	20,392	176%
	light commercial	7,069	12,864	82%	8,763	9,944	13%	9,913	7,680	-23%	8,237	4,860	-41%
	logging	2,150	10,448	386%	1,083	4,067	276%	527	2,376	351%	77	1,305	1586%
	airport service	1,611	1,601	-1%	1,479	1,478	0%	1,337	1,246	-7%	565	764	35%
	railway maintenance	323	NA	NA	370	NA	NA	379	NA	NA	268	NA	NA
	recreational marine vessels	2,168	856	-61%	2,729	965	-65%	3,410	1,149	-66%	3,700	1,368	-63%
	Subtotal: Non-Road Diesel	**129,560**	**292,330**	**126%**	**119,446**	**214,874**	**80%**	**111,714**	**147,571**	**32%**	**67,804**	**90,111**	**33%**
Other	liquified petroleum gas	18,477	NA	NA	25,270	NA	NA	11,222	NA	NA	4,393	NA	NA
	compressed natural gas	2,485	10,924	340%	3,110	12,358	297%	1,094	5,695	420%	589	4,460	657%
	Subtotal: Other Sources	20,961	10,924	-48%	28,379	12,358	-56%	12,316	5,695	-54%	4,982	4,460	-10%
TOTAL: ALL SOURCES		**164,566**	**325,389**	**98%**	**173,505**	**251,607**	**45%**	**146,092**	**177,877**	**22%**	**98,241**	**116,505**	**19%**

Exhibit D-5. Comparison of EPA Section 812 and ARB CO Emissions for California, tpy

		1990			2000			2010			2020		
TIER 2 NAME	**TIER 3 NAME**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**
Non-Road Gasoline	recreational	98,688	106,244	8%	96,366	93,541	-3%	160,473	102,822	-36%	176,602	118,302	-33%
	construction	83,783	47,537	-43%	58,626	35,089	-40%	67,656	29,119	-57%	74,778	29,444	-61%
	industrial	121,507	59,249	-51%	54,906	50,429	-8%	30,699	48,266	57%	14,165	49,710	251%
	lawn & garden	1,589,716	510,820	-68%	1,549,253	362,430	-77%	1,934,951	243,456	-87%	2,363,369	266,472	-89%
	farm	6,504	31,424	383%	7,516	25,200	235%	8,052	22,991	186%	9,028	22,143	145%
	light commercial	433,437	190,600	-56%	460,887	151,119	-67%	658,655	129,187	-80%	855,475	120,297	-86%
	logging	3,608	16,740	364%	3,245	6,377	97%	4,235	4,326	2%	5,800	4,326	-25%
	airport service	874	3,511	302%	821	3,911	376%	648	3,123	382%	640	3,151	392%
	railway maintenance	781	NA	NA	728	NA	NA	886	NA	NA	1,006	NA	NA
	recreational marine vessels	117,353	205,463	75%	131,318	251,101	91%	134,459	219,049	63%	138,933	206,876	49%
	Subtotal: Non-Road Gasoline	**2,456,252**	**1,171,588**	**-52%**	**2,363,666**	**979,198**	**-59%**	**3,000,713**	**802,338**	**-73%**	**3,639,795**	**820,722**	**-77%**
Non-Road Diesel	recreational	192	NA	NA	217	NA	NA	225	NA	NA	184	NA	NA
	construction	49,164	81,941	67%	43,465	51,731	19%	36,640	40,544	11%	18,755	38,528	105%
	industrial	7,798	14,906	91%	6,911	11,904	72%	6,468	9,354	45%	1,879	8,031	327%
	lawn & garden	2,521	1,432	-43%	3,039	1,532	-50%	2,944	220	-93%	2,300	12	-99%
	farm	8,538	32,084	276%	8,487	24,555	189%	5,835	17,666	203%	3,166	14,864	370%
	light commercial	5,565	6,235	12%	6,198	5,103	-18%	6,207	4,261	-31%	4,341	3,676	-15%
	logging	998	4,465	347%	457	1,542	238%	221	1,184	436%	31	1,161	3654%
	airport service	672	748	11%	722	670	-7%	599	642	7%	249	647	160%
	railway maintenance	310	NA	NA	331	NA	NA	295	NA	NA	180	NA	NA
	recreational marine vessels	350	356	2%	439	426	-3%	582	507	-13%	731	603	-17%
	Subtotal: Non-Road Diesel	**76,108**	**142,167**	**87%**	**70,265**	**97,464**	**39%**	**60,016**	**74,377**	**24%**	**31,817**	**67,522**	**112%**
Other	liquified petroleum gas	72,734	NA	NA	99,332	NA	NA	74,064	NA	NA	22,254	NA	NA
	compressed natural gas	9,924	25,791	160%	12,396	28,898	133%	6,298	32,073	409%	2,712	35,289	1201%
	Subtotal: Other Sources	82,659	25,791	-69%	111,728	28,898	-74%	80,362	32,073	-60%	24,967	35,289	41%
TOTAL: ALL SOURCES		**2,615,018**	**1,339,546**	**-49%**	**2,545,659**	**1,105,559**	**-57%**	**3,141,091**	**908,788**	**-71%**	**3,696,579**	**923,533**	**-75%**

Exhibit D-6. Comparison of EPA Section 812 and ARB $PM_{2.5}$ Emissions for California, tpy

		1990			2000			2010			2020		
TIER 2 NAME	**TIER 3 NAME**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**
Non-Road Gasoline	recreational	401	66	-83%	577	77	-87%	1,104	89	-92%	551	102	-82%
	construction	218	19	-91%	183	176	-4%	204	226	11%	230	237	3%
	industrial	72	26	-64%	19	32	62%	9	36	290%	4	38	966%
	lawn & garden	2,762	1,151	-58%	3,065	1,051	-66%	3,389	706	-79%	4,099	823	-80%
	farm	3	8	156%	3	24	717%	3	33	988%	4	37	925%
	light commercial	244	74	-70%	252	211	-16%	274	336	23%	355	350	-2%
	logging	19	35	85%	23	29	30%	32	32	0%	43	32	-26%
	airport service	1	3	354%	0	4	1129%	0	5	1523%	0	5	1417%
	railway maintenance	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA
	recreational marine vessels	1,885	1,260	-33%	2,508	1,909	-24%	1,940	3,103	60%	2,000	3,687	84%
	Subtotal: Non-Road Gasoline	**5,605**	**2,642**	**-53%**	**6,630**	**3,512**	**-47%**	**6,955**	**4,565**	**-34%**	**7,285**	**5,309**	**-27%**
Non-Road Diesel	recreational	28	NA	NA	32	NA	NA	32	NA	NA	27	NA	NA
	construction	9,678	10,520	9%	6,813	7,089	4%	5,373	5,098	-5%	2,651	3,267	23%
	industrial	1,650	2,164	31%	1,318	1,659	26%	890	1,370	54%	215	780	263%
	lawn & garden	488	206	-58%	581	157	-73%	492	120	-76%	348	4	-99%
	farm	2,027	4,829	138%	1,743	3,218	85%	1,070	2,227	108%	577	1,296	125%
	light commercial	1,023	912	-11%	1,124	686	-39%	1,017	578	-43%	667	346	-48%
	logging	230	646	181%	76	225	194%	37	137	275%	3	83	2405%
	airport service	163	120	-26%	119	102	-14%	87	89	3%	33	54	64%
	railway maintenance	55	NA	NA	56	NA	NA	45	NA	NA	29	NA	NA
	recreational marine vessels	55	23	-59%	68	23	-65%	57	29	-48%	54	35	-34%
	Subtotal: Non-Road Diesel	**15,398**	**19,419**	**26%**	**11,930**	**13,160**	**10%**	**9,099**	**9,649**	**6%**	**4,604**	**5,865**	**27%**
Other	liquified petroleum gas	86	NA	NA	118	NA	NA	167	NA	NA	229	NA	NA
	compressed natural gas	12	57	376%	15	66	341%	19	73	274%	25	80	218%
	Subtotal: Other Sources	**98**	**57**	**-42%**	**133**	**66**	**-51%**	**186**	**73**	**-61%**	**254**	**80**	**-68%**
TOTAL: ALL SOURCES		**21,101**	**22,118**	**5%**	**18,692**	**16,738**	**-10%**	**16,240**	**14,287**	**-12%**	**12,142**	**11,254**	**-7%**

Exhibit D-7. Comparison of EPA Section 812 and ARB SO_2 Emissions for California, tpy

		1990			2000			2010			2020		
TIER 2 NAME	**TIER 3 NAME**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**
Non-Road Gasoline	recreational	57	184	222%	63	43	-32%	10	48	355%	14	53	294%
	construction	31	12	-63%	26	10	-60%	2	11	387%	3	12	350%
	industrial	72	48	-33%	35	49	42%	2	54	3297%	1	57	9811%
	lawn & garden	624	127	-80%	666	150	-77%	67	170	155%	81	191	134%
	farm	3	10	209%	4	9	108%	0	10	2355%	0	10	2220%
	light commercial	174	53	-70%	203	55	-73%	22	61	179%	28	65	128%
	logging	1	5	326%	1	3	138%	0	3	2099%	0	3	1566%
	airport service	1	5	759%	1	7	1045%	0	8	16106%	0	9	15133%
	railway maintenance	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA
	recreational marine vessels	127	123	-3%	158	153	-3%	15	185	1112%	17	208	1118%
	Subtotal: Non-Road Gasoline	**1,091**	**566**	**-48%**	**1,156**	**479**	**-59%**	**119**	**551**	**363%**	**144**	**609**	**321%**
Non-Road Diesel	recreational	14	NA	NA	16	NA	NA	2	NA	NA	0	NA	NA
	construction	7,718	9,421	22%	7,470	86	-99%	786	96	-88%	56	100	79%
	industrial	1,405	1,508	7%	1,701	13	-99%	170	14	-92%	11	14	25%
	lawn & garden	411	0	-100%	538	0	-100%	63	0	-100%	5	0	-100%
	farm	1,054	7,047	569%	1,332	348	-74%	123	36	-71%	9	35	297%
	light commercial	784	700	-11%	952	6	-99%	99	7	-93%	8	7	-5%
	logging	181	1,037	472%	126	3	-98%	8	3	-63%	0	3	703%
	airport service	111	3	-97%	146	0	-100%	17	1	-93%	1	1	9%
	railway maintenance	28	NA	NA	34	NA	NA	3	NA	NA	0	NA	NA
	recreational marine vessels	276	2	-99%	347	0	-100%	56	0	-100%	12	0	-100%
	Subtotal: Non-Road Diesel	**11,982**	**19,719**	**65%**	**12,662**	**457**	**-96%**	**1,327**	**157**	**-88%**	**104**	**161**	**55%**
Other	liquefied petroleum gas	20	NA	NA	27	NA	NA	33	NA	NA	43	NA	NA
	compressed natural gas	2	6	163%	3	6	118%	3	7	98%	5	7	57%
	Subtotal: Other Sources	**22**	**6**	**-73%**	**30**	**6**	**-80%**	**36**	**7**	**-81%**	**48**	**7**	**-85%**
TOTAL: ALL SOURCES		**13,095**	**20,291**	**55%**	**13,849**	**942**	**-93%**	**1,483**	**715**	**-52%**	**296**	**776**	**163%**

Pechan reviewed the differences resulting for specific equipment categories, focusing on those categories exhibiting the largest differences. In cases where category differences are relatively consistent among pollutants and for all years, this appears to be due in part to differences in base year engine populations between the two models. For example, ARB consistently reports at least 50 percent less emissions for all pollutants (except SO_2) for the gasoline lawn and garden equipment category.

Pechan noted the following equipment categories exhibiting relatively consistent differences among pollutants and years:

- Gasoline lawn and garden;
- Gasoline commercial; and
- Diesel farm.

Note that these trends did not hold for future year SO_2 emissions where they held for other pollutants, so the discussion below does not apply to SO_2. Differences in SO_2 emissions will be addressed separately, since SO_2 emissions are largely dependent on fuel sulfur content levels used as input to the emissions models.

To examine the differences in populations, Pechan obtained equipment populations (Alexis, 2005) used as the basis for ARB's emission estimates reported in *Emission Inventory Data - Almanac Emission Projection Data.* A comparison of EPA and ARB equipment populations at the Tier 3 level is shown in Exhibit D-8.

Gasoline lawn and garden

Statewide gasoline lawn and garden equipment populations are estimated by ARB to be one-half or less than EPA's NONROAD model. ARB estimates about 5 million engines, while NONROAD estimates 10 million. ARB's differences for the lawn and garden category explain much of the differences in the overall nonroad inventory. This is especially the case for VOC and CO where this category accounts for a significant percentage of the mass emissions, and to a lesser extent for $PM_{2.5}$. By way of example, replacing 2000 EPA estimates with ARB-equivalent estimates for VOC results in an overall difference of 5 percent between ARB and EPA (compared to 28 percent), and for CO results in an overall difference of 19 percent (compared to 57 percent).

In addition, Gasoline 4-Stroke Commercial Turf Equipment (SCC 2265004071) was not included as an equipment application in ARB's report, OFFROAD Modeling Change Technical Memo (ARB, 2003). This equipment type was a significant contributor to Statewide California VOC emissions per EPA's Section 812 study based on NONROAD (accounted for 13 percent of total gasoline lawn and garden VOC emissions).

Exhibit D-8. Comparison of EPA Section 812 and ARB Equipment Populations for California

		1990			2000			2010			2020		
TIER 2 NAME	**TIER 3 NAME**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**	**EPA**	**ARB**	**Percent Difference**
Non-Road Gasoline	recreational	474,527	NA	NA	552,109	NA	NA	1,219,027	NA	NA	1,507,163	NA	NA
	construction	103,825	85,581	-18%	90,549	86,980	-4%	105,142	96,658	-8%	118,557	100,203	-15%
	industrial	36,351	24,770	-32%	17,229	25,767	50%	10,049	28,356	182%	3,534	29,427	733%
	lawn & garden	8,469,006	4,250,477	-50%	10,173,873	4,977,790	-51%	12,836,281	5,702,750	-56%	15,666,277	6,459,540	-59%
	farm	20,989	153,754	633%	27,241	163,994	502%	32,340	180,480	458%	38,909	194,589	400%
	light commercial	618,856	395,988	-36%	800,502	411,909	-49%	1,119,012	458,263	-59%	1,458,661	476,339	-67%
	logging	9,875	20,801	111%	11,180	11,961	7%	15,655	11,961	-24%	21,148	11,961	-43%
	airport service	226	1,832	710%	247	2,426	884%	289	3,001	939%	334	3,208	861%
	railway maintenance	1,347	NA	NA	1,524	NA	NA	1,759	NA	NA	2,009	NA	NA
	recreational marine vessels	751,069	748,406	0%	858,994	892,854	4%	958,501	1,054,957	10%	1,063,961	1,160,254	9%
	Subtotal: Non-Road Gasoline	**10,486,071**	**5,681,609**	**-46%**	**12,533,447**	**6,573,682**	**-48%**	**16,298,055**	**7,536,425**	**-54%**	**19,880,555**	**8,435,521**	**-58%**
Non-Road Diesel	recreational	2,608	NA	NA	3,250	NA	NA	4,375	NA	NA	5,572	NA	NA
	construction	155,013	160,741	4%	164,009	168,571	3%	238,214	188,342	-21%	319,417	195,436	-39%
	industrial	37,045	51,209	38%	48,665	57,056	17%	68,023	61,832	-9%	90,395	62,661	-31%
	lawn & garden	40,614	37,811	-7%	58,174	44,248	-24%	93,681	50,685	-46%	131,506	57,443	-56%
	farm	35,770	192,098	437%	49,330	195,940	297%	62,779	186,335	197%	79,383	176,762	123%
	light commercial	88,604	51,858	-41%	117,606	53,736	-54%	168,852	59,506	-65%	223,502	61,789	-72%
	logging	1,308	4,844	270%	996	2,785	180%	910	2,785	206%	866	2,785	222%
	airport service	1,532	1,492	-3%	2,201	1,973	-10%	3,510	2,436	-31%	4,902	2,616	-47%
	railway maintenance	938	NA	NA	1,235	NA	NA	1,746	NA	NA	2,289	NA	NA
	recreational marine vessels	17,096	20,134	18%	21,509	19,700	-8%	28,952	19,858	-31%	36,872	20,748	-44%
	Subtotal: Non-Road Diesel	**380,526**	**520,188**	**37%**	**466,976**	**544,009**	**16%**	**671,042**	**571,780**	**-15%**	**894,705**	**580,240**	**-35%**
Other	liquified petroleum gas	49,282	NA	NA	68,336	NA	NA	101,369	NA	NA	140,666	NA	NA
	compressed natural gas	7,074	NA	NA	9,004	NA	NA	12,015	NA	NA	15,752	NA	NA
	Subtotal: Other Sources	**56,356**	**0**	**-100%**	**77,340**	**0**	**-100%**	**113,385**	**0**	**-100%**	**156,418**	**0**	**-100%**
TOTAL: ALL SOURCES		**10,922,953**	**6,201,796**	**-43%**	**13,077,762**	**7,117,691**	**-46%**	**17,082,482**	**8,108,204**	**-53%**	**20,931,678**	**9,015,760**	**-57%**

It should be noted that ARB recently conducted a Statewide survey of California households to determine the population and usage of residential and commercial lawn and garden equipment. The results show a revised estimate of approximately 13 million pieces of equipment (ARB, 2003). These revised equipment populations are expected to result in increased VOC and CO emissions for ARB, making their OFFROAD model results more comparable to EPA's estimates.

Gasoline Light Commercial

Gasoline light commercial emissions from ARB are also consistently lower, with a few exceptions (e.g., NO_x in 1990, and $PM_{2.5}$ in 2010). Light commercial is the second highest equipment category contributing to CO emissions (lawn and garden is first), and this category accounts for about 9 percent of the total VOC emissions from gasoline engines. Equipment populations for this category are about 49 percent lower than EPA estimates in 2000, and up to 67 percent lower than EPA estimates in 2020. ARB VOC, NO_x, and CO emissions average about 56 percent lower in 2000, and 65 percent lower in 2020. Based on available ARB documentation for this category, the source of the original national population data is PSR for both OFFROAD and NONROAD, so the source of the difference is likely in how State-level populations are estimated from national populations (PSR does not report State-level equipment populations). For NONROAD, commercial equipment populations in California are estimated to be 12 percent of the national total, using the number of wholesale establishments as a surrogate allocation factor.

Diesel Farm Equipment

Diesel farm equipment emissions from ARB are consistently 200 to 300 percent higher for VOC, CO, NO_x, and about 100 percent higher for $PM_{2.5}$. In examining the equipment populations for diesel farm equipment, the ARB estimates are considerably higher than EPA estimates. For example in 2000, equipment populations are close to 300 percent higher than EPA according to ARB (195,940 versus 49,330). These discrepancies result from differences in the source of the population estimates. ARB estimates populations of agricultural tractors, balers and combines based on the United States Department of Agriculture's 1997 Census of Agriculture. Agricultural tractors account for the majority of total agricultural equipment activity and emissions. EPA uses PSR engine sales data to estimate national populations for all agricultural equipment, allocated to counties using surrogate data on acres of crop harvested.

Scenario Year Comparison

Certain equipment categories show comparable estimates for the base year. However, in comparing future year emissions, the ARB estimates become increasingly lower for each projection year. This is the case for the gasoline recreational marine category, which would result from either a lower growth rate assumed by ARB, or more stringent California engine standards than EPA for this category. A discussion of this category, and other categories whose differences vary by analysis year, follows below.

Recreational Marine

In base year 2000, ARB's gasoline recreational marine VOC emissions are only 3 percent lower than EPA. However, in 2010 and 2020, ARB estimates are 14 percent and 39 percent lower, respectively, than EPA VOC estimates. ARB has implemented more stringent exhaust emission standards for SI marine engines sold for use in California. The California outboard/personal watercraft (OB/PWC) standards accelerate the Federal 2006 standard to 2001 in California, then introduce two further tiers of emission standards. These two tiers begin with the 2004 and 2008 model years and are about 20 percent and 65 percent, respectively, lower than the Federal 2006 OB/PWC HC+ NO_x standards. As such, cleaner engines are introduced into the fleet earlier and result in overall fleet-average emissions that are lower than emissions resulting from EPA standards in 2010 and 2020.

Diesel Construction Equipment

For some pollutants, base year estimates show greater differences than future year emissions. For example, for diesel construction NO_x emissions, 1990 and 2000 year estimates are considerably higher than EPA (94 percent and 69 percent respectively). Given that ARB and EPA engine populations are comparable for these years, these differences are likely due to different activity rates, different emission rates, or possibly a different horsepower distribution of the modeled engines. In examining specific equipment applications, it was found that for the highest NO_x emitting diesel SCC, Diesel Rubber Tire Loaders, ARB estimates annual activity to be 1346 hours per year, compared with EPA's estimate of 761 hours per year (ARB is 77 percent higher) (ARB, 2005b). This activity difference may explain in part the emission differences observed.

These differences become less pronounced in 2010 and 2020, which is likely due in part to ARB's lower growth rate for diesel construction (and diesel engines in general). For example, ARB's annual average growth rate between 2000 and 2020 for diesel construction equipment populations is about 1 percent, compared to EPA's annual growth rate of about 5 percent for this source type.

Sulfur Dioxide

SO_2 emissions are proportional to fuel consumption and fuel sulfur content levels used as input to the emissions models. The SO_2 discrepancies are due in part to differences between California's and EPA's fuel sulfur program (i.e., required fuel sulfur levels and phase-in schedule). The fuel sulfur content levels used as input to the ARB's OFFROAD model were obtained from public documentation on ARB's web site (ARB, 2005c). Exhibit D-9 presents a summary of ARB's fuel sulfur levels compared to EPA for gasoline and diesel engines for all four analysis years.

Exhibit D-9. Nonroad Gasoline and Diesel Fuel Sulfur Levels, ppm

	1990	2000	2010	2020
Gasoline				
EPA	339	339	30	30
ARB	220	22	15	15
Diesel				
EPA	2,500	2,284	170	11
ARB	3,000	140	15	15

Exhibit D-10 compares the trend in EPA's and ARB's SO_2 emissions for all gasoline engines, and also shows the fuel sulfur levels used by ARB and EPA for each analysis year. For 1990 and 2000, the SO_2 emissions vary with the fuel sulfur input values. In 1990 and the base year, ARB assumes a lower fuel sulfur content level than EPA. However, these emissions are estimated by ARB to increase slightly in 2010 and 2020, whereas EPA models a sharp drop in SO_2 due to the change in gasoline fuel sulfur levels required by their Tier 2 standard (i.e., from 339 ppm sulfur in 2000 to 30 ppm in 2010 and 2020).

Exhibit D-10. Nonroad Gasoline SO_2 Emissions and Sulfur Content

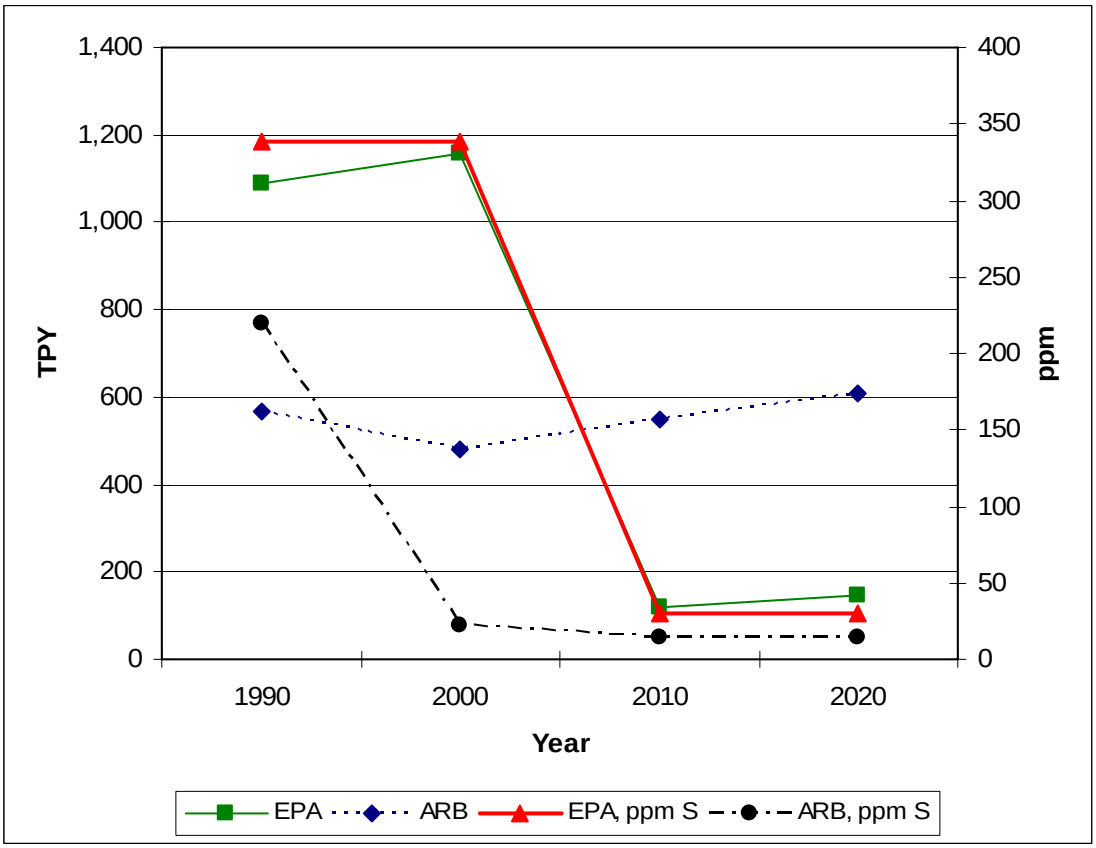
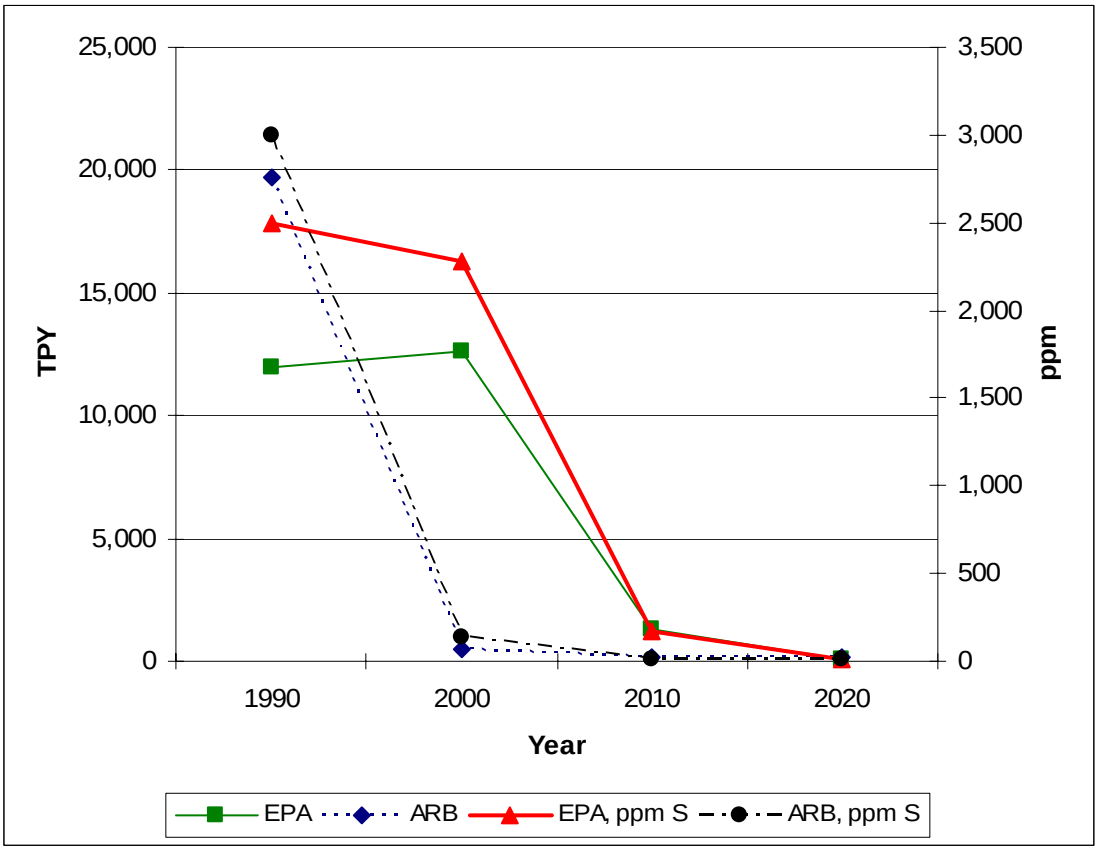


Exhibit D-11 shows EPA and ARB SO_2 emissions for diesel engines. The SO_2 emissions for ARB and EPA both track reasonably well with the fuel sulfur levels also presented in Exhibit D-11. ARB's 1990 diesel SO_2 emissions are considerably higher than EPA. In 2000, ARB estimates much lower SO_2 emissions than EPA, that level off somewhat in 2010 and 2020. In contrast, EPA estimates a sharp drop in SO_2 due to the change in diesel fuel sulfur levels required from the Clean Air Diesel Rule (see Exhibit D-9).

Exhibit D-11. Nonroad Diesel SO_2 Emissions and Sulfur Content



Conclusions

Differences between base and future year ARB and EPA nonroad emission estimates for California can be explained by differences in equipment activity, category-specific future emission standards, and variations in fuel input data (e.g., fuel sulfur content), depending on the equipment category and pollutant.

In examining equipment activity levels, Pechan first focused on obtaining equipment populations from ARB for the majority of nonroad categories. (A more comprehensive comparison of ARB and EPA nonroad emission models would include investigations into differences in annual hours of use, load factors, as well as horsepower distributions for all applications. The mix of equipment populations by horsepower can have a large impact on the resulting emissions, since emission rates and emission standards apply based on engine type and size, and not based on SCC.) The initial emission estimates that ARB provided were not organized by SCC or horsepower, but at a more aggregate category level. As such, it was not possible for Pechan to do a comprehensive comparison of SCC and horsepower distributions, but any differences in this assumed distribution are expected to result in differences in emissions.

After examining emission standards and equipment populations for categories exhibiting the largest differences, Pechan did examine some of the other activity variables (e.g., annual hours of use and load

factor) by SCC where readily available on ARB's web site. Differences in these two activity variables, as well as equipment populations, appear to be causing some of the observed differences.

Using ARB OFFROAD based emissions in place of EPA's NONROAD emissions will result in lower levels of VOC (up to 40 percent lower) and CO (up to 75 percent lower). These differences are expected to be less if updated California survey results for lawn and garden equipment are incorporated. ARB's NO_x estimates are higher for all scenario years (from 98 percent higher in 1990 to about 20 percent higher for the years 2010 and 2020). Using California's fuel sulfur levels specified by ARB in place of the national defaults for California would result in more comparable emissions for SO_2. The emission factors would then be consistent between NONROAD and ARB OFFROAD, but differences in SO_2 emissions will remain where there are differences in activity estimates for some equipment categories.

REFERENCES

Alexis, 2005: Andy Alexis, California Air Resources Board, *Off-road Population 1990 to 2010.xls*, spreadsheet obtained via e-mail, November 28, 2005.

ARB, 2003: California Air Resources Board, OFFROAD Modeling Change Technical Memo, Subject: Change in Population and Activity Factors for Lawn and Garden Equipment, M. Cordero and W. Wong, June 13, 2003.

ARB, 2005a: Air Resources Board, *Emission Inventory Data - Almanac Emission Projection Data*, available at http://www.arb.ca.gov/ei/emsmain/reportform.htm, nonroad sector data for 1990, 2000, 2010, and 2020 downloaded July 22, 2005.

ARB, 2005b: California Air Resources Board Mobile Source Mailout MSC #99-32, Data spreadsheet "Large Diesel CA data.xls," downloaded from http://www.arb.ca.gov/msei/off-road/pubs.htm on November 4, 2005.

ARB, 2005c: California Air Resources Board, OFFROAD Modeling Change Technical Memo, Subject: OFFROAD Exhaust Emissions Inventory Fuel Correction Factors, T. Sicat, July 25, 2005.

Exhibit D-12. EPA Tier Category Assignments for ARB Nonroad Categories

TIER2	TIER2NAME	TIER3	TIER3NAME	EIC	EICSUM	EICSOU	EICMAT	EICSUB
01	Non-Road Gasoline	01	recreational	850-870-1100-0000	850-OFF-ROAD REC VEHICLES	870-SNOWMOBILES	1100-GASOLINE	0000-SUB-CATEGORY UNSPECIFIED
01	Non-Road Gasoline	01	recreational	850-872-1100-0000	850-OFF-ROAD REC VEHICLES	872-OFF-ROAD MOTORCYCLES	1100-GASOLINE	0000-SUB-CATEGORY UNSPECIFIED
01	Non-Road Gasoline	01	recreational	850-874-1100-0000	850-OFF-ROAD REC VEHICLES	874-ALL-TERRAIN VEHICLES (ATV'S)	1100-GASOLINE	0000-SUB-CATEGORY UNSPECIFIED
01	Non-Road Gasoline	01	recreational	850-876-1100-0000	850-OFF-ROAD REC VEHICLES	876-FOUR-WHEEL DRIVE VEHICLES	1100-GASOLINE	0000-SUB-CATEGORY UNSPECIFIED
01	Non-Road Gasoline	02	construction	860-887-1100-0020	860-OFF-ROAD EQUIPMENT	887-CONSTRUCTION AND MINING EQUIPMENT	1100-GASOLINE	0020-TWO-STROKE EXHAUST
01	Non-Road Gasoline	02	construction	860-887-1100-0021	860-OFF-ROAD EQUIPMENT	887-CONSTRUCTION AND MINING EQUIPMENT	1100-GASOLINE	0021-TWO-STROKE EVAPORATIVE
01	Non-Road Gasoline	02	construction	860-887-1100-0040	860-OFF-ROAD EQUIPMENT	887-CONSTRUCTION AND MINING EQUIPMENT	1100-GASOLINE	0040-FOUR-STROKE EXHAUST
01	Non-Road Gasoline	02	construction	860-887-1100-0041	860-OFF-ROAD EQUIPMENT	887-CONSTRUCTION AND MINING EQUIPMENT	1100-GASOLINE	0041-FOUR-STROKE EVAPORATIVE
01	Non-Road Gasoline	03	industrial	860-884-1100-0040	860-OFF-ROAD EQUIPMENT	884-TRANSPORT REFRIGERATION UNITS	1100-GASOLINE	0040-FOUR-STROKE EXHAUST
01	Non-Road Gasoline	03	industrial	860-884-1100-0041	860-OFF-ROAD EQUIPMENT	884-TRANSPORT REFRIGERATION UNITS	1100-GASOLINE	0041-FOUR-STROKE EVAPORATIVE
01	Non-Road Gasoline	03	industrial	860-886-1100-0020	860-OFF-ROAD EQUIPMENT	886-INDUSTRIAL EQUIPMENT	1100-GASOLINE	0020-TWO-STROKE EXHAUST
01	Non-Road Gasoline	03	industrial	860-886-1100-0021	860-OFF-ROAD EQUIPMENT	886-INDUSTRIAL EQUIPMENT	1100-GASOLINE	0021-TWO-STROKE EVAPORATIVE
01	Non-Road Gasoline	03	industrial	860-886-1100-0040	860-OFF-ROAD EQUIPMENT	886-INDUSTRIAL EQUIPMENT	1100-GASOLINE	0040-FOUR-STROKE EXHAUST
01	Non-Road Gasoline	03	industrial	860-886-1100-0041	860-OFF-ROAD EQUIPMENT	886-INDUSTRIAL EQUIPMENT	1100-GASOLINE	0041-FOUR-STROKE EVAPORATIVE
01	Non-Road Gasoline	04	lawn & garden	860-883-1100-0020	860-OFF-ROAD EQUIPMENT	883-LAWN AND GARDEN EQUIPMENT	1100-GASOLINE	0020-TWO-STROKE EXHAUST
01	Non-Road Gasoline	04	lawn & garden	860-883-1100-0021	860-OFF-ROAD EQUIPMENT	883-LAWN AND GARDEN EQUIPMENT	1100-GASOLINE	0021-TWO-STROKE EVAPORATIVE
01	Non-Road Gasoline	04	lawn & garden	860-883-1100-0040	860-OFF-ROAD EQUIPMENT	883-LAWN AND GARDEN EQUIPMENT	1100-GASOLINE	0040-FOUR-STROKE EXHAUST
01	Non-Road Gasoline	04	lawn & garden	860-883-1100-0041	860-OFF-ROAD EQUIPMENT	883-LAWN AND GARDEN EQUIPMENT	1100-GASOLINE	0041-FOUR-STROKE EVAPORATIVE
01	Non-Road Gasoline	05	farm	870-893-1100-0040	870-FARM EQUIPMENT	893-AGRICULTURAL EQUIPMENT	1100-GASOLINE	0040-FOUR-STROKE EXHAUST
01	Non-Road Gasoline	05	farm	870-893-1100-0041	870-FARM EQUIPMENT	893-AGRICULTURAL EQUIPMENT	1100-GASOLINE	0041-FOUR-STROKE EVAPORATIVE
01	Non-Road Gasoline	06	light commercial	860-885-1100-0020	860-OFF-ROAD EQUIPMENT	885-LIGHT COMMERCIAL EQUIPMENT	1100-GASOLINE	0020-TWO-STROKE EXHAUST
01	Non-Road Gasoline	06	light commercial	860-885-1100-0021	860-OFF-ROAD EQUIPMENT	885-LIGHT COMMERCIAL EQUIPMENT	1100-GASOLINE	0021-TWO-STROKE EVAPORATIVE
01	Non-Road Gasoline	06	light commercial	860-885-1100-0040	860-OFF-ROAD EQUIPMENT	885-LIGHT COMMERCIAL EQUIPMENT	1100-GASOLINE	0040-FOUR-STROKE EXHAUST
01	Non-Road Gasoline	06	light commercial	860-885-1100-0041	860-OFF-ROAD EQUIPMENT	885-LIGHT COMMERCIAL EQUIPMENT	1100-GASOLINE	0041-FOUR-STROKE EVAPORATIVE
01	Non-Road Gasoline	07	logging	860-888-1100-0020	860-OFF-ROAD EQUIPMENT	888-LOGGING EQUIPMENT	1100-GASOLINE	0020-TWO-STROKE EXHAUST
01	Non-Road Gasoline	07	logging	860-888-1100-0021	860-OFF-ROAD EQUIPMENT	888-LOGGING EQUIPMENT	1100-GASOLINE	0021-TWO-STROKE EVAPORATIVE
01	Non-Road Gasoline	07	logging	860-888-1100-0040	860-OFF-ROAD EQUIPMENT	888-LOGGING EQUIPMENT	1100-GASOLINE	0040-FOUR-STROKE EXHAUST
01	Non-Road Gasoline	07	logging	860-888-1100-0041	860-OFF-ROAD EQUIPMENT	888-LOGGING EQUIPMENT	1100-GASOLINE	0041-FOUR-STROKE EVAPORATIVE
01	Non-Road Gasoline	08	airport service	860-889-1100-0040	860-OFF-ROAD EQUIPMENT	889-AIRPORT GROUND SUPPORT EQUIPMENT	1100-GASOLINE	0040-FOUR-STROKE EXHAUST
01	Non-Road Gasoline	08	airport service	860-889-1100-0041	860-OFF-ROAD EQUIPMENT	889-AIRPORT GROUND SUPPORT EQUIPMENT	1100-GASOLINE	0041-FOUR-STROKE EVAPORATIVE
01	Non-Road Gasoline	10	recreational marine vessels	840-864-1100-0020	840-RECREATIONAL BOATS	864-RECREATIONAL BOATS	1100-GASOLINE	0020-TWO-STROKE EXHAUST
01	Non-Road Gasoline	10	recreational marine vessels	840-864-1100-0021	840-RECREATIONAL BOATS	864-RECREATIONAL BOATS	1100-GASOLINE	0021-TWO-STROKE EVAPORATIVE
01	Non-Road Gasoline	10	recreational marine vessels	840-864-1100-0040	840-RECREATIONAL BOATS	864-RECREATIONAL BOATS	1100-GASOLINE	0040-FOUR-STROKE EXHAUST
01	Non-Road Gasoline	10	recreational marine vessels	840-864-1100-0041	840-RECREATIONAL BOATS	864-RECREATIONAL BOATS	1100-GASOLINE	0041-FOUR-STROKE EVAPORATIVE
02	Non-Road Diesel	02	construction	860-887-1210-0000	860-OFF-ROAD EQUIPMENT	887-CONSTRUCTION AND MINING EQUIPMENT	1210-DIESEL	0000-SUB-CATEGORY UNSPECIFIED
02	Non-Road Diesel	03	industrial	860-884-1210-0000	860-OFF-ROAD EQUIPMENT	884-TRANSPORT REFRIGERATION UNITS	1210-DIESEL	0000-SUB-CATEGORY UNSPECIFIED
02	Non-Road Diesel	03	industrial	860-886-1210-0000	860-OFF-ROAD EQUIPMENT	886-INDUSTRIAL EQUIPMENT	1210-DIESEL	0000-SUB-CATEGORY UNSPECIFIED
02	Non-Road Diesel	03	industrial	860-890-1210-0000	860-OFF-ROAD EQUIPMENT	890-DREDGING	1210-DIESEL	0000-SUB-CATEGORY UNSPECIFIED
02	Non-Road Diesel	03	industrial	860-891-1210-0000	860-OFF-ROAD EQUIPMENT	891-OIL DRILLING AND WORKOVER	1210-DIESEL	0000-SUB-CATEGORY UNSPECIFIED
02	Non-Road Diesel	03	industrial	860-892-1210-0000	860-OFF-ROAD EQUIPMENT	892-MILITARY TACTICAL SUPPORT EQUIPMENT	1210-DIESEL	0000-SUB-CATEGORY UNSPECIFIED
02	Non-Road Diesel	03	industrial	860-995-1210-0000	860-OFF-ROAD EQUIPMENT	995-OTHER	1210-DIESEL	0000-SUB-CATEGORY UNSPECIFIED
02	Non-Road Diesel	04	lawn & garden	860-883-1210-0000	860-OFF-ROAD EQUIPMENT	883-LAWN AND GARDEN EQUIPMENT	1210-DIESEL	0000-SUB-CATEGORY UNSPECIFIED
02	Non-Road Diesel	05	farm	870-893-1210-0000	870-FARM EQUIPMENT	893-AGRICULTURAL EQUIPMENT	1210-DIESEL	0000-SUB-CATEGORY UNSPECIFIED
02	Non-Road Diesel	06	light commercial	860-885-1210-0000	860-OFF-ROAD EQUIPMENT	885-LIGHT COMMERCIAL EQUIPMENT	1210-DIESEL	0000-SUB-CATEGORY UNSPECIFIED
02	Non-Road Diesel	07	logging	860-888-1210-0000	860-OFF-ROAD EQUIPMENT	888-LOGGING EQUIPMENT	1210-DIESEL	0000-SUB-CATEGORY UNSPECIFIED
02	Non-Road Diesel	08	airport service	860-889-1210-0000	860-OFF-ROAD EQUIPMENT	889-AIRPORT GROUND SUPPORT EQUIPMENT	1210-DIESEL	0000-SUB-CATEGORY UNSPECIFIED
02	Non-Road Diesel	10	recreational marine vessels	840-864-1210-0000	840-RECREATIONAL BOATS	864-RECREATIONAL BOATS	1210-DIESEL	0000-SUB-CATEGORY UNSPECIFIED
06	Other	02	compressed natural gas	860-885-0110-0000	860-OFF-ROAD EQUIPMENT	885-LIGHT COMMERCIAL EQUIPMENT	0110-NATURAL GAS	0000-SUB-CATEGORY UNSPECIFIED
06	Other	02	compressed natural gas	860-886-0110-0000	860-OFF-ROAD EQUIPMENT	886-INDUSTRIAL EQUIPMENT	0110-NATURAL GAS	0000-SUB-CATEGORY UNSPECIFIED
06	Other	02	compressed natural gas	860-889-0110-0000	860-OFF-ROAD EQUIPMENT	889-AIRPORT GROUND SUPPORT EQUIPMENT	0110-NATURAL GAS	0000-SUB-CATEGORY UNSPECIFIED

NOTES: EIC = ARB's Emission Inventory Code

APPENDIX E

SENSITIVITY ANALYSIS: INPUTS FOR OFFROAD CONSTRUCTION EQUIPMENT

INTRODUCTION

EPA's NONROAD model was determined by the EPA Science Advisory Board Air Quality Modeling Subcommittee (AQMS) to be the most appropriate tool for estimating non-road mobile source emissions outside of California. However, recent studies by States suggest that activity factors for construction vehicles may differ substantially from the values included in the NONROAD model. Based on these findings, the AQMS suggested that the project team conduct sensitivity analyses that specifically address this uncertainty. Nonroad "activity factors" are comprised of several variables, including equipment population, engine horsepower and load factor, and annual hours of use. Some of the studies questioning the validity of the NONROAD activity factors concluded that NONROAD underestimates annual hours of use per unit of equipment and overestimates total equipment populations. Because these changes offset each other (at least partially), the overall effect on activity is unclear.

Based on the emission estimation equation, the relationship between emissions and each activity variable is linear. Activity for nonroad equipment is calculated using the following equation:

Activity = Power x Load Factor x Time x Pop

Activity	=	activity (horsepower [hp]-hours)
Power	=	average rated engine power (hp)
Load Factor	=	engine load factor (average proportion of rated power)
Time	=	hours of use (hours)
Pop	=	equipment population

This analysis focuses on base year *with-CAAA* scenario emissions for 2000. Note that revisions to hours of use data also affect rates of scrappage and phase-in of new, cleaner engines, which will affect future year emissions.

To gauge the potential significance of these activity factors, Pechan compared year 2000 emissions developed from default activity inputs included in NONROAD with emissions developed from revised inputs from three local construction activity studies. The three specific studies include: (1) Lake Michigan Air Directors Consortium (LADCO) Nonroad Emissions Inventory Project; (2) Clark County-Wide Inventory of Non-road Engines Project; and (3) Houston-Galveston Area Diesel Construction Emissions Project. Pechan first generated annual emission estimates for the geographic areas covered by the surveys using NONROAD2004 and all default data inputs. Pechan then adjusted the NONROAD model activity inputs using the reported survey results to generate revised emission estimates for comparison. This analysis focused on five priority construction equipment applications, or source

classification codes (SCCs). In addition, because the base activity is the same for all pollutants, and differences in pollutant estimates are due to differences in emission rates, the analysis was limited to oxides of nitrogen (NO_x) emissions.

In summary, this analysis shows that local surveys of nonroad equipment populations and activity produce NO_x emission estimates that can be considerably higher or lower than estimates made using EPA's NONROAD model defaults. For both LADCO studies, overall NO_x emissions are higher in the local area study than in the section 812 analysis, as emissions increases for the three largest equipment types outweigh decreases in those for the other two equipment types studied.. For Clark County, much lower equipment populations for all surveyed source categories lead to a much lower estimate of construction equipment NO_x emissions for the area. Finally, for the Houston area study, lower estimated equipment activity for four equipment types contribute to a overall NO_x emission decrease for the equipment types studied.

Assuming that national populations estimated by NONROAD are a reliable measure of the total in-use national engine populations, lower estimates of equipment populations based on surveys in certain areas would be expected to be offset by increases in other areas. However, the differences observed at the local level suggest that there is considerable uncertainty in the construction equipment emission estimates for any individual geographic area. In addition, the differences also imply that use of NONROAD default data might lead to some errors in performing any local controls analysis to simulate how an area might respond to 8-hour ozone and $PM_{2.5}$ NAAQS control requirements. Control decisions would be expected to be significantly different in areas like Clark County, NV depending on whether national defaults or local survey data are used to determine the importance of off-road construction equipment.

SURVEY DATA COMPARISONS

Project Team member E.H. Pechan ran EPA's NONROAD2004 model (NR2004) to develop year 2000 *with-CAAA* NO_x emission estimates for geographic areas/studies provided in Exhibit E-1 (EPA, 2004). For the LADCO survey, Pechan compared State-level results for one State in the LADCO region (Ohio), as well as results for the entire five-State region. For the Clark County and Houston-Galveston surveys, county level results were compared.

Exhibit E-1. Construction Equipment Surveys Included in Analysis

Study	Region	Reference
Lake Michigan Air Directors Consortium (LADCO) Nonroad Emissions Inventory Project	Five States – Illinois, Indiana, Michigan, Ohio, Wisconsin	Pechan, 2004
Clark County-Wide Inventory of Non-road Engines Project	Clark County, Nevada	MACTEC, 2003
Houston-Galveston Area Diesel Construction Emissions Project	8 Texas Counties – Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller	ERG, 2000

These runs were performed using all NR2004 defaults. Pechan compared the survey results to the Section 812 results for five select construction source classification codes (SCCs), shown in Exhibit E-2. These SCCs typically rank as the top-emitters of NO_x when local or national emission inventories are prepared using default NONROAD model inputs.

Exhibit E-2. Priority SCCs for Construction Equipment Sensitivity Analysis

SCC	SCC Name
2270002036	Excavators
2270002060	Rubber Tire Loaders
2270002066	Tractors/Loaders/Backhoes
2270002069	Crawler Tractor/Dozers
2270002072	Skid Steer Loaders

Because the base activity is the same for all pollutants, and differences in pollutant estimates are due to differences in emission rates, the analysis was limited to NO_x emissions.

The results of default runs were compared with NR2004 results generated by varying the equipment population and annual hours of use values from the local surveys. The annual 2000 NO_x emissions resulting from data inputs collected for each of the four studies and the default NONROAD NO_x emissions are presented and discussed in the sections below.

For each study, the equipment populations and annual hours of use values are also compared with EPA defaults. Changes in total activity are represented by changes in these two variables only, since load factor and horsepower do not change. Percent differences in survey values compared to EPA defaults are shown graphically in bar charts. It should be noted, however, that the impact of activity changes on NO_x emissions will depend on the original values for population and hours of use, and how these two variables compare to each other before the adjustment. For example, if equipment populations are much higher than annual hours of use, then an equivalent percent change for usage will result in a negligible impact on emissions (see Clark County results below). Because the product of equipment populations and annual hours of use provides a more accurate indication of changes in total activity, these two variables are multiplied and compared as well.

State Of Ohio - Ladco Study

For this study, firms classified under specified SIC groupings were randomly surveyed using a computer assisted telephone interview (CATI) system. To scale the results to the LADCO region, equipment populations were estimated based on scaling factors derived from the survey results. Scaling factors were developed for each SIC/equipment type combination by dividing the number of pieces of equipment by the total number of employees. State-level employment by SIC was then multiplied by this scaling factor to yield an estimate of State-level SCC-level equipment populations.

Equipment-specific annual hours of use were estimated by multiplying hours of operation per week, by weeks of operation per year. Note that hours of use for all SCCs for the LADCO study was assumed to be 20 percent higher than the NR2004 default values based on a statistical analysis of results for all SCCs combined (the responses by SCC were not deemed statistically valid to make SCC-specific adjustments).

Exhibit E-3 compares the SCC-level population, annual hours of use (hereafter referred to as 'usage'), and NO_x emissions resulting from the NR2004 default inputs and the survey data. Exhibit E-4 displays in chart format the percent difference in population, usage, and NO_x emissions of survey results from NR2004 results. Percent difference is calculated using the following formula:

$$\%\ Difference = (Survey\ Data - NR2004\ Data) / NR2004\ Data \times 100$$

For Crawler Tractor/Dozers and Excavators, a 15 percent increase in equipment populations and 20 percent increase in usage results in NO_x increases of approximately 30 percent. Rubber-Tired Loaders show comparable, though slightly lower, equipment populations, but the increased usage results in a 15 percent NO_x increase. For Skid Steer Loaders and Tractors/Loaders/Backhoes, significant decreases in equipment populations are offset somewhat by the increased usage. NO_x emissions are about 65 to 40 percent lower for Skid Steer Loaders and Tractors/Loaders/Backhoes, respectively.

Five-State Region – Ladco Study

In addition to the Ohio-specific results discussed above, results for all five States combined were analyzed as well. Exhibit E-5 compares the SCC-level population, usage, and NO_x emissions resulting from the NR2004 default inputs and the survey data. Exhibit E-6 displays the percent difference in activity and NO_x emissions of SCC-level survey results from NR2004 results.

For Crawler Tractor/Dozers, Rubber Tire Loaders and Excavators, increases for both usage and equipment populations between 20 and 40 percent higher result in NO_x increases around 40 to 60 percent higher than NR2004 default results. For Skid Steer Loaders and Tractors/Loaders/Backhoes, significant decreases in equipment populations are offset somewhat by the increased usage. NO_x emissions are about 60 to 30 percent lower for Skid Steer Loaders and Tractors/Loaders/Backhoes, respectively. Compared to Ohio results, region-wide the NO_x increases seen for three SCCs are higher, and the emission decreases observed for two SCCs are slightly lower.

Clark County Nevada Study

The Clark County study attempted to survey 100 percent of the large construction firms (with revenues greater than $50 million), and a random sample of smaller firms owning equipment, as well as equipment rental companies. The data were collected using a mail-out survey with follow-up telephone calls. Equipment populations for surveyed establishments were extrapolated to the entire county based on employment data. Annual hours of use was calculated from the product of operating hours per day, operating days per week, and operating weeks per year, and weighted by the equipment populations reported by the respondent.

Exhibit E-7 compares the SCC-level population, usage, and NO_x emissions resulting from the NR2004 default inputs and the survey data obtained from the Clark County Study. Exhibit E-8 displays the percent difference in activity and NO_x emissions of survey results from NR2004 results.

For all SCCs, significant decreases in equipment populations are not offset by increases in usage. NO_x emissions predicted with the Clark County inputs are about 90 percent lower than EPA. This results because total activity, expressed as equipment populations multiplied by hours of use, is significantly lower as predicted by the survey results compared to NR2004 for each SCC (see Exhibit E-7).

Eight-County Houston Area – Houston-Galveston Study

For this study, a survey was conducted of diesel construction equipment populations and activity within the eight county Houston area. Quantitative measures of company/organization market share or related metrics were obtained for survey respondents to use as a surrogate for extrapolating population values. Equipment usage data in hours per year were based on a number of sources, including engine clock hour data, labor records (e.g., hours for crane operators), estimator or field supervisor estimates, and fuel use records.

Exhibit E-9 compares the SCC-level population, usage, and NO_x emissions resulting from the NR2004 default inputs and the survey data obtained from the Houston-Galveston Study. Exhibit E-10 displays the percent difference in activity and NO_x emissions of survey results from NR2004 results.

For Skid Steer Loaders and Rubber Tire Loaders significant decreases in equipment populations are offset somewhat by the increased usage. NO_x emissions are about 80 and 40 percent lower for Skid Steer Loaders and Rubber Tire Loaders, respectively. For Tractors/Loaders/Backhoes, decreases in both equipment populations and usage result in NO_x decreases close to 60 percent. For Excavators, lower equipment populations outweigh higher usage to cause NO_x decreases of 15 percent. Finally, Crawler Tractor/Dozers show increased NO_x emissions due to higher equipment populations, offsetting lower usage.

Exhibit E-3. Activity and Emissions Comparison (Ohio-LADCO)

	Population		Hrs/Yr		Population * Hrs/Yr				NO_x, tpy		
EQUIPMENT	NR2004	LADCO	NR2004	LADCO	NR2004	LADCO	Difference (LADCO-NR2004)	% Difference (LADCO-NR2004)/ NR2004	NR2004	LADCO	% Difference
Skid Steer Loaders	23,122	6,573	818	982	18,913,548	6,454,388	-12,459,160	-66%	2,103	697	-67%
Crawler Tractor/Dozers	4,280	4,860	936	1,123	4,006,173	5,457,903	1,451,729	36%	4,687	6,167	32%
Tractors/Loaders/Backhoes	14,858	7,540	1,135	1,362	16,863,488	10,269,456	-6,594,032	-39%	3,239	1,884	-42%
Rubber Tire Loaders	6,162	6,094	761	913	4,689,586	5,564,263	874,678	19%	5,356	6,092	14%
Excavators	5,569	6,336	1,092	1,310	6,081,566	8,299,695	2,218,129	36%	4,356	5,688	31%

Exhibit E-4. Percent Difference in Activity and NO_x Emissions (Ohio-LADCO)

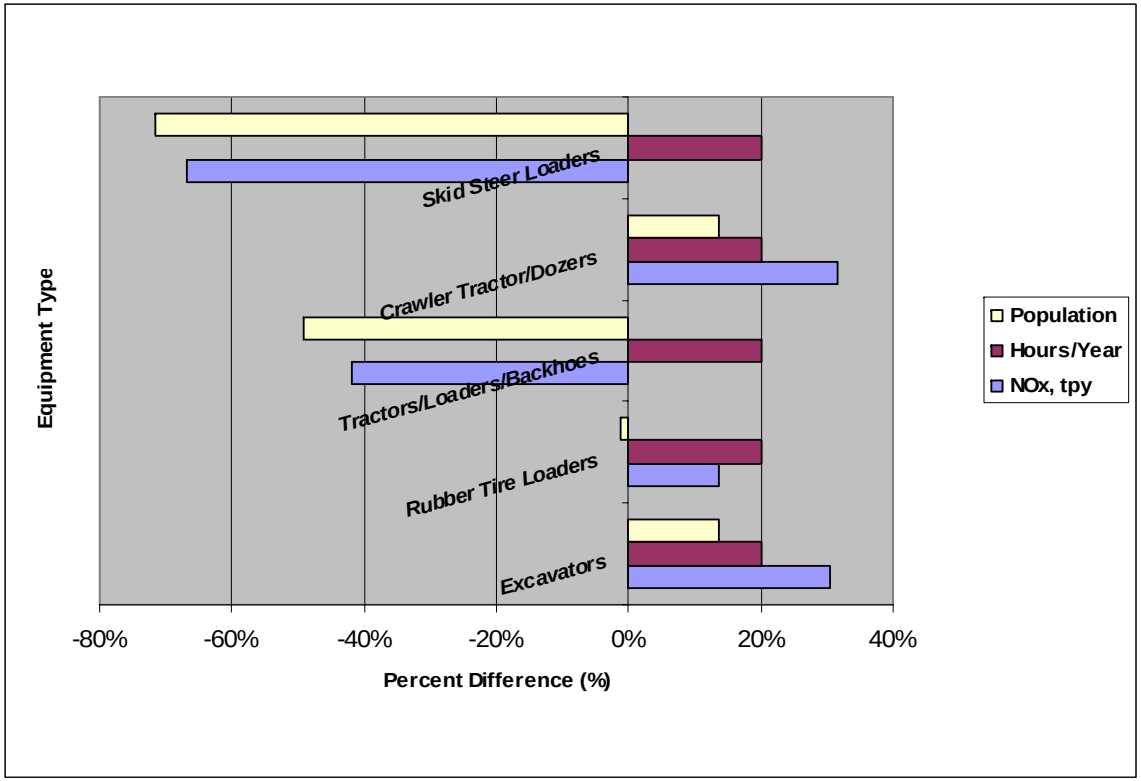


Exhibit E-5. Activity and Emissions Comparison (5-State Region-LADCO)

	Population		Hrs/Yr		Population * Hrs/Yr				NO_x, tpy		
EQUIPMENT	NR2004	LADCO	NR2004	LADCO	NR2004	LADCO	Difference (LADCO-NR2004)	% Difference (LADCO-NR2004)/ NR2004	NR2004	LADCO	% Difference
Skid Steer Loaders	76,837	27,944	818	982	62,852,416	27,441,094	-35,411,322	-56%	6,989	2,961	-58%
Crawler Tractor/Dozers	14,223	18,623	936	1,123	13,313,008	20,913,995	7,600,987	57%	15,577	23,632	52%
Tractors/Loaders/Backhoes	49,374	30,650	1,135	1,362	56,039,943	41,745,941	-14,294,001	-26%	10,764	7,658	-29%
Rubber Tire Loaders	20,478	24,654	761	913	15,583,984	22,509,032	6,925,048	44%	17,795	24,644	38%
Excavators	18,507	25,307	1,092	1,310	20,209,752	33,151,616	12,941,864	64%	14,473	22,722	57%

Exhibit E-6. Percent Difference in Activity and NO_x Emissions (5-State Region-LADCO)

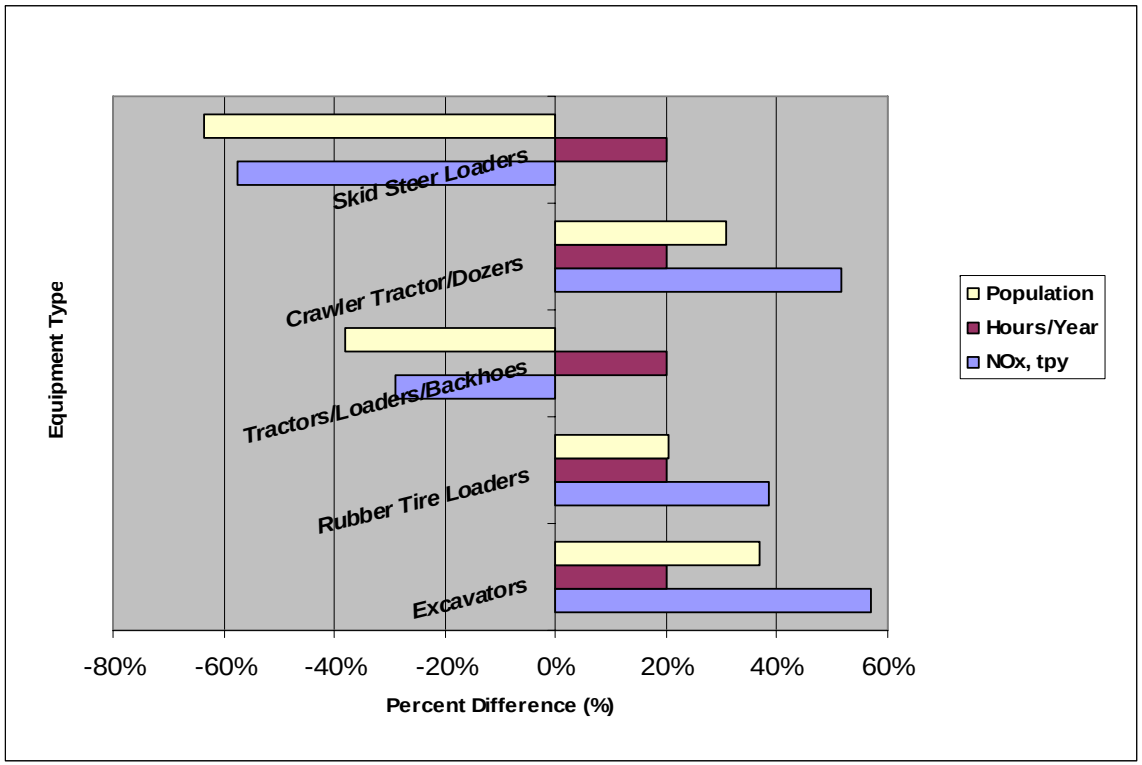


Exhibit E-7. Activity and Emissions Comparison (Clark County, Nevada)

	Population		Hrs/Yr		Population * Hrs/Yr				NO_x, tpy		
EQUIPMENT	NR2004	Clark Co	NR2004	Clark Co	NR2004	Clark Co	Difference (Clark Co-NR2004)	% Difference (Clark Co-NR2004)/ NR2004	NR2004	Clark Co	% Difference
Skid Steer Loaders	6,834	209	818	1,280	5,590,301	267,520	-5,322,781	-95%	622	27	-96%
Crawler Tractor/Dozers	1,265	73	936	1,186	1,184,086	86,578	-1,097,508	-93%	1,385	97	-93%
Tractors/Loaders/Backhoes	4,392	330	1,135	1,812	4,984,451	597,960	-4,386,491	-88%	957	102	-89%
Rubber Tire Loaders	1,821	68	761	1,648	1,385,963	112,064	-1,273,899	-92%	1,582	108	-93%
Excavators	1,646	141	1,092	1,437	1,797,711	202,617	-1,595,094	-89%	1,288	136	-89%

Exhibit E-8. Percent Difference in Activity and NO_x Emissions (Clark County, Nevada)

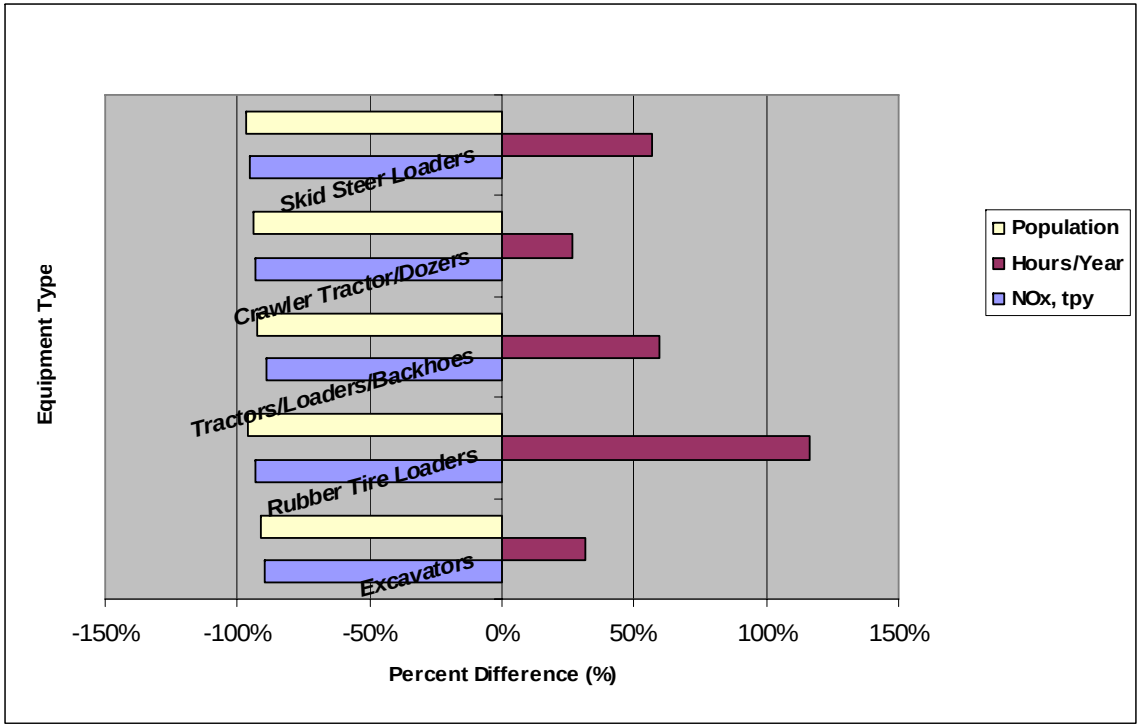
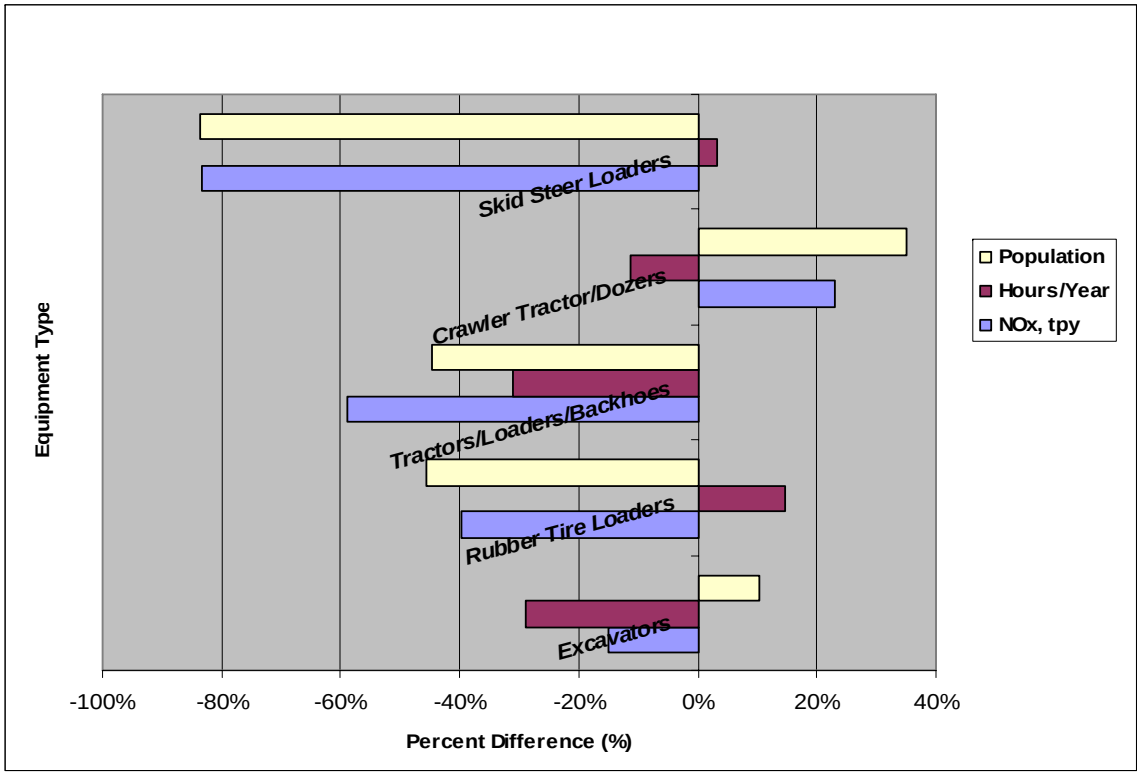


Exhibit E-9. Activity and Emissions Comparison (Houston-Galveston Study)

	Population		Hrs/Yr		Population * Hrs/Yr				NO_x, tpy		
EQUIPMENT	NR2004	Houston	NR2004	Houston	NR2004	Houston	Difference (Houston-NR2004)	% Difference (Houston-NR2004)/NR2004	NR2004	Houston	% Difference
Skid Steer Loaders	8,129	1,328	818	845	6,649,485	1,122,160	-5,527,325	-83%	739	124	-83%
Crawler Tractor/Dozers	1,505	2,031	936	829	1,408,453	1,683,699	275,246	20%	1,648	2,025	23%
Tractors/Loaders/Backhoes	5,224	2,887	1,135	781	5,928,810	2,254,747	-3,674,063	-62%	1,139	467	-59%
Rubber Tire Loaders	2,167	1,179	761	872	1,648,734	1,028,088	-620,646	-38%	1,883	1,137	-40%
Excavators	1,958	2,161	1,092	777	2,138,069	1,679,097	-458,972	-21%	1,531	1,302	-15%

Exhibit E-10. Percent Difference in Activity and NO_x Emissions (Houston-Galveston)



CONCLUSIONS

For each study, the total equipment populations, usage, and NO_x emissions for all five SCCs are presented in Exhibit E-11. Percent differences in survey values compared to EPA defaults are shown in Exhibit E-12.

Note that for both LADCO studies, the overall NO_x emissions increase for all five SCCs, since increases for the three largest contributors (i.e., crawler tractor/dozers, rubber tire loaders, and excavators) outweigh decreases in the other two SCCs. For Clark County, large decreases in populations for all SCCs lead to overall NO_x emission decreases. Finally, for the Houston area study, declines in activity for four SCCs contribute to a NO_x emission decrease for all five SCCs combined.

The NONROAD model allocates national level equipment populations to counties based on surrogate indicators. The national populations are based on data provided by Power Systems Research (PSR), determined from engine manufacturer sales and usage surveys, and estimated engine life (EPA, 2002). Therefore, lower estimates for local equipment populations based on surveys may be offset by higher estimates for other areas if the national populations estimated by NONROAD are a reliable measure of the total in-use national engine populations. Hours of use values based on surveys may also be higher if survey respondents are providing these data for only the equipment they operate more frequently (i.e., it may not represent a fleet-wide average that should account for low-use equipment).

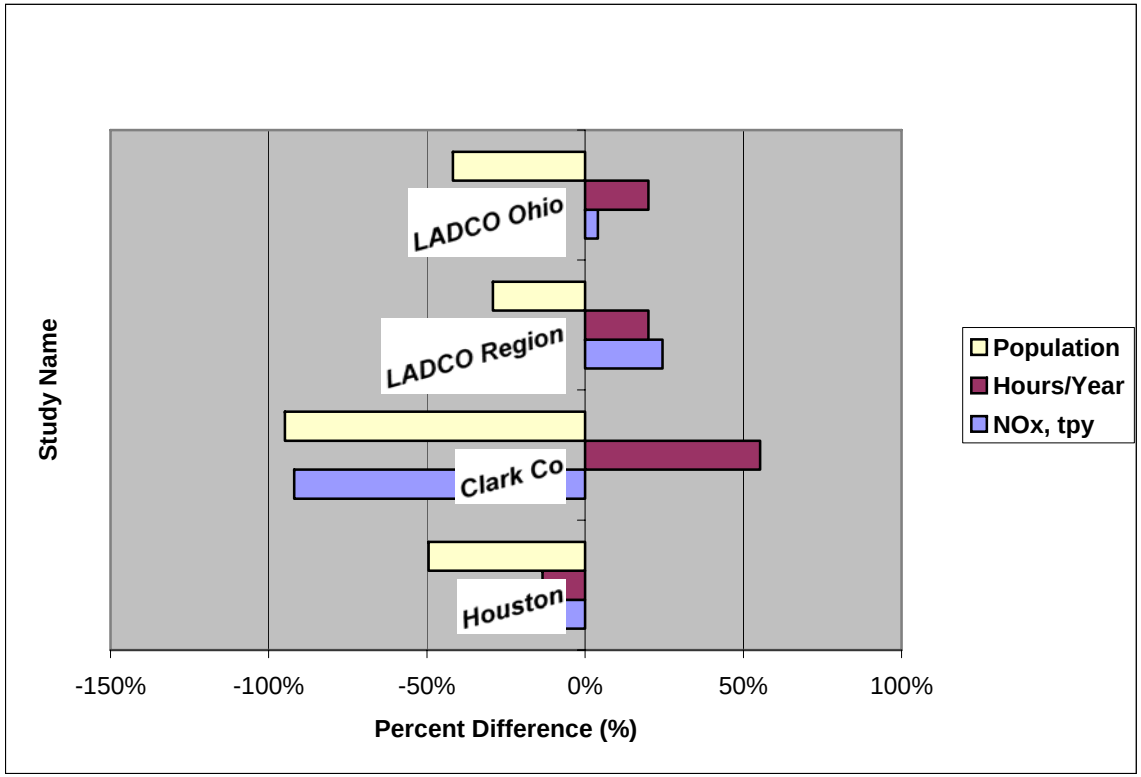
To obtain the actual equipment populations and the hours of use for a given geographic area, one would need to survey every equipment user. Because time and resources to survey each user may be prohibitive, random surveys of users are typically performed. To our knowledge, the survey results we have reviewed do not provide an estimate of survey error, so we cannot evaluate whether the differences are statiscially significant.

Finally, to gauge the true impact on emissions, surveys should also focus on collecting statistically valid data for engine load factors and horsepower distributions, since these variables also affect emissions and may be intrinsically tied to local equipment populations and hours of use. One limitation of the survey data is that none of these studies collected sufficient data to replace default inputs for load factor or the horsepower distribution (and some did not request these data). For example, applications may operate more hours but they may also be operating at a lower average load factor, which would offset the increased usage.

Exhibit E-11. Comparison for Construction Studies

	Population		Hrs/Yr		Population * Hrs/Yr				NO_x, tpy		
	NR2004	LADCO	NR2004	LADCO	NR2004	Houston	Difference	% Difference	NR2004	LADCO	% Difference
LADCO Ohio	53,991	31,403	4,742	5690	256,025,772	178,682,596	-77,343,176	-30%	19,741	20,528	4%
LADCO Region	179,420	127,178	4,742	5690	850,808,639	723,645,010	-127,163,629	-15%	65,599	81,618	24%
Clark County	15,958	821	4,742	7363	75,673,969	6,045,023	-69,628,946	-92%	5,835	470	-92%
Houston	18,982	9,586	4,742	4104	90,011,733	39,340,944	-50,670,789	-56%	6,940	5,056	-27%

Exhibit E-12. Percent Difference in Activity and NO_x Emissions for Construction Studies



Impacts On Section 812 Inventory

The impacts that revised activity inputs have on total off-road NO_x emission estimates vary depending on the relative contribution of area-specific NO_x emissions to the NO_x emissions for a given inventory area. The following examples using Clark County results illustrate this point.

The impact of incorporating Clark County survey-based NO_x emissions for the SCCs analyzed in the inventory for Clark County, for the State of Nevada, and for the entire United States, is shown in Exhibits E-12a, 13b, and 13c, respectively. The first column shows 2002 NO_x emissions using NR2004 default data, and the second column shows results using survey inputs. Clearly, the impact depends on the geographic area for which estimates are compared. The differences are most significant when considering local or State area inventories. However, when considering the impact these county-level differences have on the national SCC emissions inventory, the differences are relatively small.

Exhibit E-13a. Clark County Inventory Comparison

SCC	NR2004 NO_x, tpy	Clark Co NO_x, tpy	% Difference
2270002036	1,288	136	-89%
2270002060	1,582	108	-93%
2270002066	957	102	-89%
2270002069	1,385	97	-93%
2270002072	622	27	-96%

Exhibit E-13b. Nevada State-Level Inventory Comparison

	NR2004 NO_x, tpy	Clark Co NO_x, tpy	% Difference
2270002036	1,510	374	-75%
2270002060	1,855	401	-78%
2270002066	1,122	279	-75%
2270002069	1,624	353	-78%
2270002072	732	143	-80%

Exhibit E-13c. National Inventory Comparison

	NR2004 NO_x, tpy	Clark Co NO_x, tpy	% Difference
2270002036	98,295	97,159	-1%
2270002060	120,888	119,434	-1%
2270002066	73,134	72,291	-1%
2270002069	105,758	104,487	-1%
2270002072	47,271	46,682	-1%

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Appendix F
Crosswalk Between Maximum Achievable Control Technology (MACT) Codes and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
MACT CODE	MACT DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
105	Stationary Reciprocating Internal Combustion Engines	INDC1801; INDC2101	Industrial	Mining and Refining	Distillate	National
0105-2	Stationary Reciprocating Internal Combustion Engines - Oil	INDC1801; INDC2101	Industrial	Mining and Refining	Distillate	National
0105-3	Stationary Reciprocating Internal Combustion Engines - Gas	INDC1803; INDC2103	Industrial	Mining and Refining	Natural Gas	National
107	Industrial/Commercial/ Institutional Boilers & Process Heaters	COMC1102; INDC2201	Commercial; Industrial		Delivered Energy	Regional
0107-1	Industrial/Commercial/Institutional Boilers & Process Heaters: Coal	COMC1101; INDC2213	Commercial; Industrial		Coal	Regional
0107-2	Industrial/Commercial/Institutional Boilers & Process Heaters: Natural Gas	COMC1107; INDC2206	Commercial; Industrial		Natural Gas	Regional
0107-3	Industrial/Commercial/Institutional Boilers & Process Heaters: Oil	COMC1103; INDC2202	Commercial; Industrial		Distillate	Regional
0107-4	Industrial/Commercial/Institutional Boilers & Process Heaters: Wood/Waste	COMC1109; INDC2210	Commercial; Industrial		Renewable Energy	Regional
108	Stationary Combustion Turbines	ELEC1209	Electric Generation		Total - Nuclear - Imports	Regional
0108-1	Stationary Combustion Turbines	ELEC1204	Electric Generation		Natural Gas	Regional
302	Coke Ovens: Charging, Top Side, and Door Leaks	INDC1602	Industrial	Iron and Steel	Metallurgical Coal	National
303	Coke Ovens: Pushing, Quenching, & Battery Stacks	INDC1602	Industrial	Iron and Steel	Metallurgical Coal	National
501	Oil & Natural Gas Production	PETP3101	Energy Production		Crude Oil and Natural Gas	Regional
502	Petroleum Refineries - Catalytic Cracking, Catalytic Reforming, & Sulfur Plant Units	PETS3001	Energy Production		Refined Petroleum Products	National
503	Petroleum Refineries - Other Sources Not Distinctly Listed	PETS3001	Energy Production		Refined Petroleum Products	National
504	Natural Gas Transmission & Storage	TOTC2504	Total Energy		Natural Gas	Regional
601	Gasoline Distribution (Stage I)	TRAN4001	Transportation		Motor Gasoline	Regional
1808-1	Utility Boilers: Coal	ELEC1208	Electric Generation		Steam Coal	Regional
1808-2	Utility Boilers: Natural Gas	ELEC1204	Electric Generation		Natural Gas	Regional
1808-3	Utility Boilers: Oil	ELEC1201	Electric Generation		Distillate	Regional

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
10200060		INDC2201	Industrial	Total Industrial	Delivered Energy	Regional
10200101	External Combustion Boilers, Industrial, Anthracite Coal, Pulverized Coal	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200104	External Combustion Boilers, Industrial, Anthracite Coal, Traveling Grate (Overfeed) Stoker	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200107	External Combustion Boilers, Industrial, Anthracite Coal, Hand-fired	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200201	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Pulverized Coal: Wet Bottom	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200202	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Pulverized Coal: Dry Bottom	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200203	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Cyclone Furnace	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200204	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Spreader Stoker	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200205	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Overfeed Stoker	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200206	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Underfeed Stoker	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200210	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Overfeed Stoker **	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200212	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Pulverized Coal: Dry Bottom (Tangential)	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200213	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Wet Slurry	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200217	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Atmospheric Fluidized Bed Combustion: Bubbling Bed (Bituminous Coal)	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200219	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Cogeneration (Bituminous Coal)	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200221	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Pulverized Coal: Wet Bottom (Subbituminous Coal)	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200222	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Pulverized Coal: Dry Bottom (Subbituminous Coal)	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200223	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Cyclone Furnace (Subbituminous Coal)	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200224	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Spreader Stoker (Subbituminous Coal)	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200225	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Traveling Grate (Overfeed) Stoker (Subbituminous Coal)	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200226	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Pulverized Coal: Dry Bottom Tangential (Subbituminous Coal)	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200229	External Combustion Boilers, Industrial, Bituminous/Subbituminous Coal, Cogeneration (Subbituminous Coal)	INDC2213	Industrial	Total Industrial	Total Coal	Regional
10200301	External Combustion Boilers, Industrial, Lignite, Pulverized Coal: Dry Bottom, Wall Fired	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200303	External Combustion Boilers, Industrial, Lignite, Cyclone Furnace	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200306	External Combustion Boilers, Industrial, Lignite, Spreader Stoker	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
10200307	External Combustion Boilers, Industrial, Lignite, Cogeneration	INDC2213	Industrial	Total Industrial	Total Coal	Regional
10200401	External Combustion Boilers, Industrial, Residual Oil, Grade 6 Oil	INDC2211	Industrial	Total Industrial	Residual	Regional
10200402	External Combustion Boilers, Industrial, Residual Oil, 10-100 Million Btu/hr **	INDC2211	Industrial	Total Industrial	Residual	Regional
10200403	External Combustion Boilers, Industrial, Residual Oil, < 10 Million Btu/hr **	INDC2211	Industrial	Total Industrial	Residual	Regional
10200404	External Combustion Boilers, Industrial, Residual Oil, Grade 5 Oil	INDC2211	Industrial	Total Industrial	Residual	Regional
10200405	External Combustion Boilers, Industrial, Residual Oil, Cogeneration	INDC2211	Industrial	Total Industrial	Residual	Regional
10200501	External Combustion Boilers, Industrial, Distillate Oil, Grades 1 and 2 Oil	INDC2202	Industrial	Total Industrial	Distillate	Regional
10200502	External Combustion Boilers, Industrial, Distillate Oil, 10-100 Million Btu/hr **	INDC2202	Industrial	Total Industrial	Distillate	Regional
10200503	External Combustion Boilers, Industrial, Distillate Oil, < 10 Million Btu/hr **	INDC2202	Industrial	Total Industrial	Distillate	Regional
10200504	External Combustion Boilers, Industrial, Distillate Oil, Grade 4 Oil	INDC2202	Industrial	Total Industrial	Distillate	Regional

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
10200505	External Combustion Boilers, Industrial, Distillate Oil, Cogeneration	INDC2202	Industrial	Total Industrial	Distillate	Regional
10200601	External Combustion Boilers, Industrial, Natural Gas, > 100 Million Btu/hr	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
10200602	External Combustion Boilers, Industrial, Natural Gas, 10-100 Million Btu/hr	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
10200603	External Combustion Boilers, Industrial, Natural Gas, < 10 Million Btu/hr	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
10200604	External Combustion Boilers, Industrial, Natural Gas, Cogeneration	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
10200699		INDC2206	Industrial	Total Industrial	Natural Gas	Regional
10200701	External Combustion Boilers, Industrial, Process Gas, Petroleum Refinery Gas	INDC2107	Industrial	Refining	Still Gas	National
10200704	External Combustion Boilers, Industrial, Process Gas, Blast Furnace Gas	INDC1602	Industrial	Iron and Steel	Metallurgical Coal	National
10200707	External Combustion Boilers, Industrial, Process Gas, Coke Oven Gas	INDC1602	Industrial	Iron and Steel	Metallurgical Coal	National
10200710	External Combustion Boilers, Industrial, Process Gas, Cogeneration	INDC2201	Industrial	Total Industrial	Delivered Energy	Regional
10200799	External Combustion Boilers, Industrial, Process Gas, Other: Specify in Comments	INDC2201	Industrial	Total Industrial	Delivered Energy	Regional
10200802	External Combustion Boilers, Industrial, Coke, All Boiler Sizes	INDC2207	Industrial	Total Industrial	Other Petroleum	Regional
10200804	External Combustion Boilers, Industrial, Coke, Cogeneration	INDC2207	Industrial	Total Industrial	Other Petroleum	Regional
10200901	External Combustion Boilers, Industrial, Wood/Bark Waste, Bark-fired Boiler	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
10200902	External Combustion Boilers, Industrial, Wood/Bark Waste, Wood/Bark-fired Boiler	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
10200903	External Combustion Boilers, Industrial, Wood/Bark Waste, Wood-fired Boiler - Wet Wood (>=20% moisture)	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
10200904	External Combustion Boilers, Industrial, Wood/Bark Waste, Bark-fired Boiler (< 50,000 Lb Steam) **	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
10200905	External Combustion Boilers, Industrial, Wood/Bark Waste, Wood/Bark-fired Boiler (< 50,000 Lb Steam) **	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
10200906	External Combustion Boilers, Industrial, Wood/Bark Waste, Wood-fired Boiler (< 50,000 Lb Steam) **	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
10200907	External Combustion Boilers, Industrial, Wood/Bark Waste, Wood Cogeneration	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
10201001	External Combustion Boilers, Industrial, Liquified Petroleum Gas (LPG), Butane	INDC2203	Industrial	Total Industrial	Liquified Petroleum Gas	Regional
10201002	External Combustion Boilers, Industrial, Liquified Petroleum Gas (LPG), Propane	INDC2203	Industrial	Total Industrial	Liquified Petroleum Gas	Regional
10201101	External Combustion Boilers, Industrial, Bagasse, All Boiler Sizes	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
10201201	External Combustion Boilers, Industrial, Solid Waste, Specify Waste Material in Comments	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
10201301	External Combustion Boilers, Industrial, Liquid Waste, Specify Waste Material in Comments	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
10201302	External Combustion Boilers, Industrial, Liquid Waste, Waste Oil	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
10201401	External Combustion Boilers, Industrial, CO Boiler, Natural Gas	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
10201402	External Combustion Boilers, Industrial, CO Boiler, Process Gas	INDC2201	Industrial	Total Industrial	Delivered Energy	Regional
10201404	External Combustion Boilers, Industrial, CO Boiler, Residual Oil	INDC2211	Industrial	Total Industrial	Residual	Regional
10299997		INDC2201	Industrial	Total Industrial	Delivered Energy	Regional
10300101	External Combustion Boilers, Commercial/Institutional, Anthracite Coal, Pulverized Coal	COMC1101	Commercial		Coal	Regional
10300102	External Combustion Boilers, Commercial/Institutional, Anthracite Coal, Traveling Grate (Overfeed) Stoker	COMC1101	Commercial		Coal	Regional
10300103	External Combustion Boilers, Commercial/Institutional, Anthracite Coal, Hand-fired	COMC1101	Commercial		Coal	Regional
10300205	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Pulverized Coal: Wet Bottom (Bituminous Coal)	COMC1101	Commercial		Coal	Regional
10300206	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Pulverized Coal: Dry Bottom (Bituminous Coal)	COMC1101	Commercial		Coal	Regional
10300207	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Overfeed Stoker (Bituminous Coal)	COMC1101	Commercial		Coal	Regional

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
10300208	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Underfeed Stoker (Bituminous Coal)	COMC1101	Commercial		Coal	Regional
10300209	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Spreader Stoker (Bituminous Coal)	COMC1101	Commercial		Coal	Regional
10300211	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Overfeed Stoker **	COMC1101	Commercial		Coal	Regional
10300214	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Hand-fired (Bituminous Coal)	COMC1101	Commercial		Coal	Regional
10300216	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Pulverized Coal: Dry Bottom (Tangential) (Bituminous Coal)	COMC1101	Commercial		Coal	Regional
10300217	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Atmospheric Fluidized Bed Combustion: Bubbling Bed (Bituminous Coal)	COMC1101	Commercial		Coal	Regional
10300221	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Pulverized Coal: Wet Bottom (Subbituminous Coal)	COMC1101	Commercial		Coal	Regional
10300222	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Pulverized Coal: Dry Bottom (Subbituminous Coal)	COMC1101	Commercial		Coal	Regional
10300223	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Cyclone Furnace (Subbituminous Coal)	COMC1101	Commercial		Coal	Regional
10300224	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Spreader Stoker (Subbituminous Coal)	COMC1101	Commercial		Coal	Regional
10300225	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Traveling Grate (Overfeed) Stoker (Subbituminous Coal)	COMC1101	Commercial		Coal	Regional
10300226	External Combustion Boilers, Commercial/Institutional, Bituminous/Subbituminous Coal, Pulverized Coal: Dry Bottom Tangential (Subbituminous Coal)	COMC1101	Commercial		Coal	Regional
10300306	External Combustion Boilers, Commercial/Institutional, Lignite, Pulverized Coal: Dry Bottom, Tangential Fired	COMC1101	Commercial		Coal	Regional
10300309	External Combustion Boilers, Commercial/Institutional, Lignite, Spreader Stoker	COMC1101	Commercial		Coal	Regional
10300401	External Combustion Boilers, Commercial/Institutional, Residual Oil, Grade 6 Oil	COMC1110	Commercial		Residual	Regional
10300402	External Combustion Boilers, Commercial/Institutional, Residual Oil, 10-100 Million Btu/hr **	COMC1110	Commercial		Residual	Regional
10300403	External Combustion Boilers, Commercial/Institutional, Residual Oil, < 10 Million Btu/hr **	COMC1110	Commercial		Residual	Regional
10300404	External Combustion Boilers, Commercial/Institutional, Residual Oil, Grade 5 Oil	COMC1110	Commercial		Residual	Regional
10300501	External Combustion Boilers, Commercial/Institutional, Distillate Oil, Grades 1 and 2 Oil	COMC1103	Commercial		Distillate	Regional
10300502	External Combustion Boilers, Commercial/Institutional, Distillate Oil, 10-100 Million Btu/hr **	COMC1103	Commercial		Distillate	Regional
10300503	External Combustion Boilers, Commercial/Institutional, Distillate Oil, < 10 Million Btu/hr **	COMC1103	Commercial		Distillate	Regional
10300504	External Combustion Boilers, Commercial/Institutional, Distillate Oil, Grade 4 Oil	COMC1103	Commercial		Distillate	Regional
10300601	External Combustion Boilers, Commercial/Institutional, Natural Gas, > 100 Million Btu/hr	COMC1107	Commercial		Natural Gas	Regional
10300602	External Combustion Boilers, Commercial/Institutional, Natural Gas, 10-100 Million Btu/hr	COMC1107	Commercial		Natural Gas	Regional
10300603	External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr	COMC1107	Commercial		Natural Gas	Regional
10300701	External Combustion Boilers, Commercial/Institutional, Process Gas, POTW Digester Gas-fired Boiler	COMC1102	Commercial		Delivered Energy	Regional
10300799	External Combustion Boilers, Commercial/Institutional, Process Gas, Other Not Classified	COMC1102	Commercial		Delivered Energy	Regional
10300901	External Combustion Boilers, Commercial/Institutional, Wood/Bark Waste, Bark-fired Boiler	COMC1109	Commercial		Renewable Energy	Regional
10300902	External Combustion Boilers, Commercial/Institutional, Wood/Bark Waste, Wood/Bark-fired Boiler	COMC1109	Commercial		Renewable Energy	Regional
10300903	External Combustion Boilers, Commercial/Institutional, Wood/Bark Waste, Wood-fired Boiler - Wet Wood (>=20% moisture)	COMC1109	Commercial		Renewable Energy	Regional
10301001	External Combustion Boilers, Commercial/Institutional, Liquified Petroleum Gas (LPG), Butane	COMC1105	Commercial		Liquified Petroleum Gas	Regional

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
10301002	External Combustion Boilers, Commercial/Institutional, Liquified Petroleum Gas (LPG), Propane	COMC1105	Commercial		Liquified Petroleum Gas	Regional
10301201	External Combustion Boilers, Commercial/Institutional, Solid Waste, Specify Waste Material in Comments	COMC1109	Commercial		Renewable Energy	Regional
10301202	External Combustion Boilers, Commercial/Institutional, Solid Waste, Refuse Derived Fuel	COMC1109	Commercial		Renewable Energy	Regional
10301301	External Combustion Boilers, Commercial/Institutional, Liquid Waste, Specify Waste Material in Comments	COMC1109	Commercial		Renewable Energy	Regional
10301302	External Combustion Boilers, Commercial/Institutional, Liquid Waste, Waste Oil	COMC1108	Commercial		Petroleum Subtotal	Regional
10500102	External Combustion Boilers, Space Heaters, Industrial, Coal **	INDC2213	Industrial	Total Industrial	Total Coal	Regional
10500105	External Combustion Boilers, Space Heaters, Industrial, Distillate Oil	INDC2202	Industrial	Total Industrial	Distillate	Regional
10500106	External Combustion Boilers, Space Heaters, Industrial, Natural Gas	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
10500110	External Combustion Boilers, Space Heaters, Industrial, Liquified Petroleum Gas (LPG)	INDC2203	Industrial	Total Industrial	Liquified Petroleum Gas	Regional
10500113	External Combustion Boilers, Space Heaters, Industrial, Waste Oil: Air Atomized Burner	INDC2207	Industrial	Total Industrial	Other Petroleum	Regional
10500205	External Combustion Boilers, Space Heaters, Commercial/Institutional, Distillate Oil	COMC1103	Commercial		Distillate	Regional
10500206	External Combustion Boilers, Space Heaters, Commercial/Institutional, Natural Gas	COMC1107	Commercial		Natural Gas	Regional
10500209	External Combustion Boilers, Space Heaters, Commercial/Institutional, Wood	COMC1109	Commercial		Renewable Energy	Regional
10500210	External Combustion Boilers, Space Heaters, Commercial/Institutional, Liquified Petroleum Gas (LPG)	COMC1105	Commercial		Liquified Petroleum Gas	Regional
10500213	External Combustion Boilers, Space Heaters, Commercial/Institutional, Waste Oil: Air Atomized Burner	COMC1108	Commercial		Petroleum Subtotal	Regional
10500214	External Combustion Boilers, Space Heaters, Commercial/Institutional, Waste Oil: Vaporizing Burner	COMC1108	Commercial		Petroleum Subtotal	Regional
20200101	Internal Combustion Engines, Industrial, Distillate Oil (Diesel), Turbine	INDC2202	Industrial	Total Industrial	Distillate	Regional
20200102	Internal Combustion Engines, Industrial, Distillate Oil (Diesel), Reciprocating	INDC2202	Industrial	Total Industrial	Distillate	Regional
20200103	Internal Combustion Engines, Industrial, Distillate Oil (Diesel), Turbine: Cogeneration	INDC2202	Industrial	Total Industrial	Distillate	Regional
20200104	Internal Combustion Engines, Industrial, Distillate Oil (Diesel), Reciprocating: Cogeneration	INDC2202	Industrial	Total Industrial	Distillate	Regional
20200201	Internal Combustion Engines, Industrial, Natural Gas, Turbine	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
20200202	Internal Combustion Engines, Industrial, Natural Gas, Reciprocating	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
20200203	Internal Combustion Engines, Industrial, Natural Gas, Turbine: Cogeneration	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
20200204	Internal Combustion Engines, Industrial, Natural Gas, Reciprocating: Cogeneration	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
20200301	Internal Combustion Engines, Industrial, Gasoline, Reciprocating	INDC2205	Industrial	Total Industrial	Motor Gasoline	Regional
20200401	Internal Combustion Engines, Industrial, Large Bore Engine, Diesel	INDC2202	Industrial	Total Industrial	Distillate	Regional
20200402	Internal Combustion Engines, Industrial, Large Bore Engine, Dual Fuel (Oil/Gas)	INDC2209	Industrial	Total Industrial	Petroleum Subtotal & Natural Gas	Regional
20200403	Internal Combustion Engines, Industrial, Large Bore Engine, Cogeneration: Dual Fuel	INDC2209	Industrial	Total Industrial	Petroleum Subtotal & Natural Gas	Regional
20200501	Internal Combustion Engines, Industrial, Residual/Crude Oil, Reciprocating	INDC2211	Industrial	Total Industrial	Residual	Regional
20200901	Internal Combustion Engines, Industrial, Kerosene/Naphtha (Jet Fuel), Turbine	INDC2207	Industrial	Total Industrial	Other Petroleum	Regional
20200902	Internal Combustion Engines, Industrial, Kerosene/Naphtha (Jet Fuel), Reciprocating	INDC2207	Industrial	Total Industrial	Other Petroleum	Regional
20201001	Internal Combustion Engines, Industrial, Liquified Petroleum Gas (LPG), Propane: Reciprocating	INDC2203	Industrial	Total Industrial	Liquified Petroleum Gas	Regional
20201002	Internal Combustion Engines, Industrial, Liquified Petroleum Gas (LPG), Butane: Reciprocating	INDC2203	Industrial	Total Industrial	Liquified Petroleum Gas	Regional
20201003		INDC2203	Industrial	Total Industrial	Liquified Petroleum Gas	Regional

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
20201101		INDC2203	Industrial	Total Industrial	Liquified Petroleum Gas	Regional
20300101	Internal Combustion Engines, Commercial/Institutional, Distillate Oil (Diesel), Reciprocating	COMC1103	Commercial		Distillate	Regional
20300102	Internal Combustion Engines, Commercial/Institutional, Distillate Oil (Diesel), Turbine	COMC1103	Commercial		Distillate	Regional
20300201	Internal Combustion Engines, Commercial/Institutional, Natural Gas, Reciprocating	COMC1107	Commercial		Natural Gas	Regional
20300202	Internal Combustion Engines, Commercial/Institutional, Natural Gas, Turbine	COMC1107	Commercial		Natural Gas	Regional
20300203	Internal Combustion Engines, Commercial/Institutional, Natural Gas, Turbine: Cogeneration	COMC1107	Commercial		Natural Gas	Regional
20300204	Internal Combustion Engines, Commercial/Institutional, Natural Gas, Cogeneration	COMC1107	Commercial		Natural Gas	Regional
20300301	Internal Combustion Engines, Commercial/Institutional, Gasoline, Reciprocating	COMC1106	Commercial		Motor Gasoline	Regional
20300702	Internal Combustion Engines, Commercial/Institutional, Digester Gas, Reciprocating: POTW Digester Gas	COMC1109	Commercial		Renewable Energy	Regional
20300902		COMC1104	Commercial		Kerosene	Regional
20301001	Internal Combustion Engines, Commercial/Institutional, Liquified Petroleum Gas (LPG), Propane: Reciprocating	COMC1105	Commercial		Liquified Petroleum Gas	Regional
28888801	Internal Combustion Engines, Fugitive Emissions, Other Not Classified, Specify in Comments	TTRC2601	Total Energy - Transportation		Distillate Fuel	Regional
28888802	Internal Combustion Engines, Fugitive Emissions, Other Not Classified, Specify in Comments	TTRC2603	Total Energy - Transportation		Total	Regional
28888803	Internal Combustion Engines, Fugitive Emissions, Other Not Classified, Specify in Comments	TTRC2603	Total Energy - Transportation		Total	Regional
30190001	Industrial Processes, Chemical Manufacturing, Fuel Fired Equipment, Distillate Oil (No. 2): Process Heaters	INDC1301	Industrial	Bulk Chemicals	Heat and Power-Distillate	National
30190002	Industrial Processes, Chemical Manufacturing, Fuel Fired Equipment, Residual Oil: Process Heaters	INDC1303	Industrial	Bulk Chemicals	Heat and Power-Residual	National
30190003	Industrial Processes, Chemical Manufacturing, Fuel Fired Equipment, Natural Gas: Process Heaters	INDC1302	Industrial	Bulk Chemicals	Heat and Power-Natural Gas	National
30190004	Industrial Processes, Chemical Manufacturing, Fuel Fired Equipment, Process Gas: Process Heaters	INDC1304	Industrial	Bulk Chemicals	Total Heat and Power	National
30190011	Industrial Processes, Chemical Manufacturing, Fuel Fired Equipment, Distillate Oil (No. 2): Incinerators	INDC1301	Industrial	Bulk Chemicals	Heat and Power-Distillate	National
30190012	Industrial Processes, Chemical Manufacturing, Fuel Fired Equipment, Residual Oil: Incinerators	INDC1303	Industrial	Bulk Chemicals	Heat and Power-Residual	National
30190013	Industrial Processes, Chemical Manufacturing, Fuel Fired Equipment, Natural Gas: Incinerators	INDC1302	Industrial	Bulk Chemicals	Heat and Power-Natural Gas	National
30190014	Industrial Processes, Chemical Manufacturing, Fuel Fired Equipment, Process Gas: Incinerators	INDC1304	Industrial	Bulk Chemicals	Total Heat and Power	National
30190023	Industrial Processes, Chemical Manufacturing, Fuel Fired Equipment, Natural Gas: Flares	INDC1302	Industrial	Bulk Chemicals	Heat and Power-Natural Gas	National
30190099	Industrial Processes, Chemical Manufacturing, Fuel Fired Equipment, Specify in Comments Field	INDC1304	Industrial	Bulk Chemicals	Total Heat and Power	National
30290001	Industrial Processes, Food and Agriculture, Fuel Fired Equipment, Distillate Oil (No. 2): Process Heaters	INDC1501	Industrial	Food	Distillate	National
30290002	Industrial Processes, Food and Agriculture, Fuel Fired Equipment, Residual Oil: Process Heaters	INDC1504	Industrial	Food	Residual	National
30290003	Industrial Processes, Food and Agriculture, Fuel Fired Equipment, Natural Gas: Process Heaters	INDC1503	Industrial	Food	Natural Gas	National
30390001	Industrial Processes, Primary Metal Production, Fuel Fired Equipment, Distillate Oil (No. 2): Process Heaters	INDC1601	Industrial	Iron and Steel	Distillate	National
30390003	Industrial Processes, Primary Metal Production, Fuel Fired Equipment, Natural Gas: Process Heaters	INDC1603	Industrial	Iron and Steel	Natural Gas	National
30390004	Industrial Processes, Primary Metal Production, Fuel Fired Equipment, Process Gas: Process Heaters	INDC1606	Industrial	Iron and Steel	Total	National
30390013	Industrial Processes, Primary Metal Production, Fuel Fired Equipment, Natural Gas: Incinerators	INDC1603	Industrial	Iron and Steel	Natural Gas	National

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
30390014	Industrial Processes, Primary Metal Production, Fuel Fired Equipment, Process Gas: Incinerators	INDC1606	Industrial	Iron and Steel	Total	National
30390024	Industrial Processes, Primary Metal Production, Fuel Fired Equipment, Process Gas: Flares	INDC1606	Industrial	Iron and Steel	Total	National
30400406	Industrial Processes, Secondary Metal Production, Lead, Pot Furnace Heater: Distillate Oil	INDC1901	Industrial	Other Manufacturing	Distillate	National
30400407	Industrial Processes, Secondary Metal Production, Lead, Pot Furnace Heater: Natural Gas	INDC1903	Industrial	Other Manufacturing	Natural Gas	National
30490001	Industrial Processes, Secondary Metal Production, Fuel Fired Equipment, Distillate Oil (No. 2): Process Heaters	INDC1901	Industrial	Other Manufacturing	Distillate	National
30490003	Industrial Processes, Secondary Metal Production, Fuel Fired Equipment, Natural Gas: Process Heaters	INDC1903	Industrial	Other Manufacturing	Natural Gas	National
30490004	Industrial Processes, Secondary Metal Production, Fuel Fired Equipment, Process Gas: Process Heaters	INDC1908	Industrial	Other Manufacturing	Total	National
30490013	Industrial Processes, Secondary Metal Production, Fuel Fired Equipment, Natural Gas: Incinerators	INDC1903	Industrial	Other Manufacturing	Natural Gas	National
30490023	Industrial Processes, Secondary Metal Production, Fuel Fired Equipment, Natural Gas: Flares	INDC1903	Industrial	Other Manufacturing	Natural Gas	National
30490024	Industrial Processes, Secondary Metal Production, Fuel Fired Equipment, Process Gas: Flares	INDC1908	Industrial	Other Manufacturing	Total	National
30490031	Industrial Processes, Secondary Metal Production, Fuel Fired Equipment, Distillate Oil (No. 2): Furnaces	INDC1901	Industrial	Other Manufacturing	Distillate	National
30490033	Industrial Processes, Secondary Metal Production, Fuel Fired Equipment, Natural Gas: Furnaces	INDC1903	Industrial	Other Manufacturing	Natural Gas	National
30490034	Industrial Processes, Secondary Metal Production, Fuel Fired Equipment, Process Gas: Furnaces	INDC1908	Industrial	Other Manufacturing	Total	National
30500206	Industrial Processes, Mineral Products, Asphalt Concrete, Asphalt Heater: Natural Gas	INDC2103	Industrial	Refining	Natural Gas	National
30500207	Industrial Processes, Mineral Products, Asphalt Concrete, Asphalt Heater: Residual Oil	INDC2106	Industrial	Refining	Residual	National
30500208	Industrial Processes, Mineral Products, Asphalt Concrete, Asphalt Heater: Distillate Oil	INDC2101	Industrial	Refining	Distillate	National
30500209	Industrial Processes, Mineral Products, Asphalt Concrete, Asphalt Heater: LPG	INDC2102	Industrial	Refining	Liquified Petroleum Gas	National
30500210	Industrial Processes, Mineral Products, Asphalt Concrete, Asphalt Heater: Waste Oil	INDC2104	Industrial	Refining	Other Petroleum	National
30590001	Industrial Processes, Mineral Products, Fuel Fired Equipment, Distillate Oil (No. 2): Process Heaters	INDC1801	Industrial	Mining	Distillate	National
30590002	Industrial Processes, Mineral Products, Fuel Fired Equipment, Residual Oil: Process Heaters	INDC1805	Industrial	Mining	Residual	National
30590003	Industrial Processes, Mineral Products, Fuel Fired Equipment, Natural Gas: Process Heaters	INDC1803	Industrial	Mining	Natural Gas	National
30590013	Industrial Processes, Mineral Products, Fuel Fired Equipment, Natural Gas: Incinerators	INDC1803	Industrial	Mining	Natural Gas	National
30590023	Industrial Processes, Mineral Products, Fuel Fired Equipment, Natural Gas: Flares	INDC1803	Industrial	Mining	Natural Gas	National
30600101	Industrial Processes, Petroleum Industry, Process Heaters, Oil-fired **	INDC2105	Industrial	Refining	Petroleum Subtotal	National
30600102	Industrial Processes, Petroleum Industry, Process Heaters, Gas-fired **	INDC2103	Industrial	Refining	Natural Gas	National
30600103	Industrial Processes, Petroleum Industry, Process Heaters, Oil-fired	INDC2105	Industrial	Refining	Petroleum Subtotal	National
30600104	Industrial Processes, Petroleum Industry, Process Heaters, Gas-fired	INDC2103	Industrial	Refining	Natural Gas	National
30600105	Industrial Processes, Petroleum Industry, Process Heaters, Natural Gas-fired	INDC2103	Industrial	Refining	Natural Gas	National
30600106	Industrial Processes, Petroleum Industry, Process Heaters, Process Gas-fired	INDC2107	Industrial	Refining	Still Gas	National
30600107	Industrial Processes, Petroleum Industry, Process Heaters, LPG-fired	INDC2102	Industrial	Refining	Liquified Petroleum Gas	National
30600111	Industrial Processes, Petroleum Industry, Process Heaters, Oil-fired (No. 6 Oil) > 100 Million Btu Capacity	INDC2106	Industrial	Refining	Residual	National
30600197		INDC2108	Industrial	Refining	Total	National
30600199	Industrial Processes, Petroleum Industry, Process Heaters, Other Not Classified	INDC2108	Industrial	Refining	Total	National
30600201	Industrial Processes, Petroleum Industry, Catalytic Cracking Units, Fluid Catalytic Cracking Unit	PETS3001	Energy Production		Refined Petroleum Products	National

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Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
30600202	Industrial Processes, Petroleum Industry, Catalytic Cracking Units, Catalyst Handling System	PETS3001	Energy Production		Refined Petroleum Products	National
30600204		PETS3001	Energy Production		Refined Petroleum Products	National
30600301	Industrial Processes, Petroleum Industry, Catalytic Cracking Units, Thermal Catalytic Cracking Unit	PETS3001	Energy Production		Refined Petroleum Products	National
30600401	Industrial Processes, Petroleum Industry, Blowdown Systems, Blowdown System with Vapor Recovery System with Flaring	PETS3001	Energy Production		Refined Petroleum Products	National
30600402	Industrial Processes, Petroleum Industry, Blowdown Systems, Blowdown System w/o Controls	PETS3001	Energy Production		Refined Petroleum Products	National
30600503	Industrial Processes, Petroleum Industry, Wastewater Treatment, Process Drains and Wastewater Separators	PETS3001	Energy Production		Refined Petroleum Products	National
30600504	Industrial Processes, Petroleum Industry, Wastewater Treatment, Process Drains and Wastewater Separators	PETS3001	Energy Production		Refined Petroleum Products	National
30600505	Industrial Processes, Petroleum Industry, Wastewater Treatment, Wastewater Treatment w/o Separator	PETS3001	Energy Production		Refined Petroleum Products	National
30600506	Industrial Processes, Petroleum Industry, Wastewater Treatment, Wastewater Treatment w/o Separator	PETS3001	Energy Production		Refined Petroleum Products	National
30600508	Industrial Processes, Petroleum Industry, Wastewater Treatment, Oil/Water Separator	PETS3001	Energy Production		Refined Petroleum Products	National
30600514	Industrial Processes, Petroleum Industry, Wastewater Treatment, Petroleum Refinery Wastewater System: Junction Box	PETS3001	Energy Production		Refined Petroleum Products	National
30600516	Industrial Processes, Petroleum Industry, Wastewater Treatment, Petroleum Refinery Wastewater System: Aerated Impoundment	PETS3001	Energy Production		Refined Petroleum Products	National
30600517	Industrial Processes, Petroleum Industry, Wastewater Treatment, Petroleum Refinery Wastewater System: Non-aerated Impoundment	PETS3001	Energy Production		Refined Petroleum Products	National
30600518	Industrial Processes, Petroleum Industry, Wastewater Treatment, Petroleum Refinery Wastewater System: Weir	PETS3001	Energy Production		Refined Petroleum Products	National
30600519	Industrial Processes, Petroleum Industry, Wastewater Treatment, Petroleum Refinery Wastewater System: Activated Sludge Impoundment	PETS3001	Energy Production		Refined Petroleum Products	National
30600520	Industrial Processes, Petroleum Industry, Wastewater Treatment, Petroleum Refinery Wastewater System: Clarifier	PETS3001	Energy Production		Refined Petroleum Products	National
30600602	Industrial Processes, Petroleum Industry, Vacuum Distillate Column Condensors, Vacuum Distillation Column Condenser	PETS3001	Energy Production		Refined Petroleum Products	National
30600603	Industrial Processes, Petroleum Industry, Vacuum Distillate Column Condensors, Vacuum Distillation Column Condenser	PETS3001	Energy Production		Refined Petroleum Products	National
30600701	Industrial Processes, Petroleum Industry, Cooling Towers, Cooling Towers	PETS3001	Energy Production		Refined Petroleum Products	National
30600702	Industrial Processes, Petroleum Industry, Cooling Towers, Cooling Towers	PETS3001	Energy Production		Refined Petroleum Products	National

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Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
30600801	Industrial Processes, Petroleum Industry, Fugitive Emissions, Pipeline Valves and Flanges	PETS3001	Energy Production		Refined Petroleum Products	National
30600802	Industrial Processes, Petroleum Industry, Fugitive Emissions, Vessel Relief Valves	PETS3001	Energy Production		Refined Petroleum Products	National
30600803	Industrial Processes, Petroleum Industry, Fugitive Emissions, Pump Seals w/o Controls	PETS3001	Energy Production		Refined Petroleum Products	National
30600804	Industrial Processes, Petroleum Industry, Fugitive Emissions, Compressor Seals	PETS3001	Energy Production		Refined Petroleum Products	National
30600805	Industrial Processes, Petroleum Industry, Fugitive Emissions, Miscellaneous: Sampling/Non-Asphalt Blowing/Purging/etc.	PETS3001	Energy Production		Refined Petroleum Products	National
30600806	Industrial Processes, Petroleum Industry, Fugitive Emissions, Pump Seals with Controls	PETS3001	Energy Production		Refined Petroleum Products	National
30600807	Industrial Processes, Petroleum Industry, Fugitive Emissions, Blind Changing	PETS3001	Energy Production		Refined Petroleum Products	National
30600811	Industrial Processes, Petroleum Industry, Fugitive Emissions, Pipeline Valves: Gas Streams	PETS3001	Energy Production		Refined Petroleum Products	National
30600812	Industrial Processes, Petroleum Industry, Fugitive Emissions, Pipeline Valves: Light Liquid/Gas Streams	PETS3001	Energy Production		Refined Petroleum Products	National
30600813	Industrial Processes, Petroleum Industry, Fugitive Emissions, Pipeline Valves: Heavy Liquid Streams	PETS3001	Energy Production		Refined Petroleum Products	National
30600814	Industrial Processes, Petroleum Industry, Fugitive Emissions, Pipeline Valves: Hydrogen Streams	PETS3001	Energy Production		Refined Petroleum Products	National
30600815	Industrial Processes, Petroleum Industry, Fugitive Emissions, Open-ended Valves: All Streams	PETS3001	Energy Production		Refined Petroleum Products	National
30600816	Industrial Processes, Petroleum Industry, Fugitive Emissions, Flanges: All Streams	PETS3001	Energy Production		Refined Petroleum Products	National
30600817	Industrial Processes, Petroleum Industry, Fugitive Emissions, Pump Seals: Light Liquid/Gas Streams	PETS3001	Energy Production		Refined Petroleum Products	National
30600818	Industrial Processes, Petroleum Industry, Fugitive Emissions, Pump Seals: Heavy Liquid Streams	PETS3001	Energy Production		Refined Petroleum Products	National
30600819	Industrial Processes, Petroleum Industry, Fugitive Emissions, Compressor Seals: Gas Streams	PETS3001	Energy Production		Refined Petroleum Products	National
30600820	Industrial Processes, Petroleum Industry, Fugitive Emissions, Compressor Seals: Heavy Liquid Streams	PETS3001	Energy Production		Refined Petroleum Products	National
30600821	Industrial Processes, Petroleum Industry, Fugitive Emissions, Drains: All Streams	PETS3001	Energy Production		Refined Petroleum Products	National
30600822	Industrial Processes, Petroleum Industry, Fugitive Emissions, Vessel Relief Valves: All Streams	PETS3001	Energy Production		Refined Petroleum Products	National
30600901	Industrial Processes, Petroleum Industry, Flares, Distillate Oil	INDC2101	Industrial	Refining	Distillate	National
30600903	Industrial Processes, Petroleum Industry, Flares, Natural Gas	INDC2103	Industrial	Refining	Natural Gas	National

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Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
30600904	Industrial Processes, Petroleum Industry, Flares, Process Gas	INDC2107	Industrial	Refining	Still Gas	National
30600905	Industrial Processes, Petroleum Industry, Flares, Liquified Petroleum Gas	INDC2102	Industrial	Refining	Liquified Petroleum Gas	National
30600906	Industrial Processes, Petroleum Industry, Flares, Hydrogen Sulfide	INDC2108	Industrial	Refining	Total	National
30600999	Industrial Processes, Petroleum Industry, Flares, Not Classified **	INDC2108	Industrial	Refining	Total	National
30601001	Industrial Processes, Petroleum Industry, Sludge Converter, General	PETS3001	Energy Production		Refined Petroleum Products	National
30601101	Industrial Processes, Petroleum Industry, Asphalt Blowing, General	PETS3001	Energy Production		Refined Petroleum Products	National
30601201	Industrial Processes, Petroleum Industry, Fluid Coking Units, General	PETS3001	Energy Production		Refined Petroleum Products	National
30601401	Industrial Processes, Petroleum Industry, Petroleum Coke Calcining, Coke Calciner	PETS3001	Energy Production		Refined Petroleum Products	National
30601601	Industrial Processes, Petroleum Industry, Catalytic Reforming Unit, General	PETS3001	Energy Production		Refined Petroleum Products	National
30603301	Industrial Processes, Petroleum Industry, Desulfurization, Sulfur Recovery Unit	PETS3001	Energy Production		Refined Petroleum Products	National
30609901	Industrial Processes, Petroleum Industry, Incinerators, Distillate Oil (No. 2)	INDC2101	Industrial	Refining	Distillate	National
30609902	Industrial Processes, Petroleum Industry, Incinerators, Residual Oil	INDC2106	Industrial	Refining	Residual	National
30609903	Industrial Processes, Petroleum Industry, Incinerators, Natural Gas	INDC2103	Industrial	Refining	Natural Gas	National
30609904	Industrial Processes, Petroleum Industry, Incinerators, Process Gas	INDC2108	Industrial	Refining	Total	National
30609999		INDC2108	Industrial	Refining	Total	National
30610001	Industrial Processes, Petroleum Industry, Lube Oil Refining, General	PETS3001	Energy Production		Refined Petroleum Products	National
30688801	Industrial Processes, Petroleum Industry, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National
30688802	Industrial Processes, Petroleum Industry, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National
30688803	Industrial Processes, Petroleum Industry, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National
30688804	Industrial Processes, Petroleum Industry, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National
30688805	Industrial Processes, Petroleum Industry, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National
30699996		PETS3001	Energy Production		Refined Petroleum Products	National
30699998	Industrial Processes, Petroleum Industry, Petroleum Products - Not Classified, Not Classified **	PETS3001	Energy Production		Refined Petroleum Products	National
30699999	Industrial Processes, Petroleum Industry, Petroleum Products - Not Classified, Not Classified **	PETS3001	Energy Production		Refined Petroleum Products	National

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Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
30790001	Industrial Processes, Pulp and Paper and Wood Products, Fuel Fired Equipment, Distillate Oil (No. 2): Process Heaters	INDC2001	Industrial	Paper	Distillate	National
30790002	Industrial Processes, Pulp and Paper and Wood Products, Fuel Fired Equipment, Residual Oil: Process Heaters	INDC2003	Industrial	Paper	Residual	National
30790003	Industrial Processes, Pulp and Paper and Wood Products, Fuel Fired Equipment, Natural Gas: Process Heaters	INDC2002	Industrial	Paper	Natural Gas	National
30790013	Industrial Processes, Pulp and Paper and Wood Products, Fuel Fired Equipment, Natural Gas: Incinerators	INDC2002	Industrial	Paper	Natural Gas	National
30890003	Industrial Processes, Rubber and Miscellaneous Plastics Products, Fuel Fired Equipment, Natural Gas: Process Heaters	INDC1903	Industrial	Other Manufacturing	Natural Gas	National
30890013	Industrial Processes, Rubber and Miscellaneous Plastics Products, Fuel Fired Equipment, Natural Gas: Incinerators	INDC1903	Industrial	Other Manufacturing	Natural Gas	National
30890023	Industrial Processes, Rubber and Miscellaneous Plastics Products, Fuel Fired Equipment, Natural Gas: Flares	INDC1903	Industrial	Other Manufacturing	Natural Gas	National
30990001	Industrial Processes, Fabricated Metal Products, Fuel Fired Equipment, Distillate Oil (No. 2): Process Heaters	INDC1701	Industrial	Metals-Based Durables	Distillate	National
30990002	Industrial Processes, Fabricated Metal Products, Fuel Fired Equipment, Residual Oil: Process Heaters	INDC1703	Industrial	Metals-Based Durables	Residual	National
30990003	Industrial Processes, Fabricated Metal Products, Fuel Fired Equipment, Natural Gas: Process Heaters	INDC1702	Industrial	Metals-Based Durables	Natural Gas	National
30990013	Industrial Processes, Fabricated Metal Products, Fuel Fired Equipment, Natural Gas: Incinerators	INDC1702	Industrial	Metals-Based Durables	Natural Gas	National
30990023	Industrial Processes, Fabricated Metal Products, Fuel Fired Equipment, Natural Gas: Flares	INDC1702	Industrial	Metals-Based Durables	Natural Gas	National
31000101	Industrial Processes, Oil and Gas Production, Crude Oil Production, Complete Well: Fugitive Emissions	PETP3106	Energy Production		Crude Oil	Regional
31000102	Industrial Processes, Oil and Gas Production, Crude Oil Production, Miscellaneous Well: General	PETP3106	Energy Production		Crude Oil	Regional
31000103	Industrial Processes, Oil and Gas Production, Crude Oil Production, Wells: Rod Pumps	PETP3106	Energy Production		Crude Oil	Regional
31000104	Industrial Processes, Oil and Gas Production, Crude Oil Production, Crude Oil Sumps	PETP3106	Energy Production		Crude Oil	Regional
31000105	Industrial Processes, Oil and Gas Production, Crude Oil Production, Crude Oil Pits	PETP3106	Energy Production		Crude Oil	Regional
31000106	Industrial Processes, Oil and Gas Production, Crude Oil Production, Enhanced Wells, Water Reinjection	PETP3106	Energy Production		Crude Oil	Regional
31000107	Industrial Processes, Oil and Gas Production, Crude Oil Production, Oil/Gas/Water/Separation	PETP3106	Energy Production		Crude Oil	Regional
31000199	Industrial Processes, Oil and Gas Production, Crude Oil Production, Processing Operations: Not Classified	PETP3106	Energy Production		Crude Oil	Regional
31000201	Industrial Processes, Oil and Gas Production, Natural Gas Production, Gas Sweetening: Amine Process	PETP3104	Energy Production		Natural Gas	Regional
31000202	Industrial Processes, Oil and Gas Production, Natural Gas Production, Gas Stripping Operations	PETP3104	Energy Production		Natural Gas	Regional
31000203	Industrial Processes, Oil and Gas Production, Natural Gas Production, Compressors	PETP3104	Energy Production		Natural Gas	Regional
31000204	Industrial Processes, Oil and Gas Production, Natural Gas Production, Wells	PETP3104	Energy Production		Natural Gas	Regional
31000205	Industrial Processes, Oil and Gas Production, Natural Gas Production, Flares	PETP3104	Energy Production		Natural Gas	Regional
31000206	Industrial Processes, Oil and Gas Production, Natural Gas Production, Gas Lift	PETP3104	Energy Production		Natural Gas	Regional
31000207	Industrial Processes, Oil and Gas Production, Natural Gas Production, Valves: Fugitive Emissions	PETP3104	Energy Production		Natural Gas	Regional
31000208	Industrial Processes, Oil and Gas Production, Natural Gas Production, Sulfur Recovery Unit	PETP3104	Energy Production		Natural Gas	Regional
31000299	Industrial Processes, Oil and Gas Production, Natural Gas Production, Other Not Classified	PETP3104	Energy Production		Natural Gas	Regional
31000401	Industrial Processes, Oil and Gas Production, Process Heaters, Distillate Oil (No. 2)	INDC1801	Industrial	Mining	Distillate	National
31000402	Industrial Processes, Oil and Gas Production, Process Heaters, Residual Oil	INDC1805	Industrial	Mining	Residual	National
31000403	Industrial Processes, Oil and Gas Production, Process Heaters, Crude Oil	INDC1804	Industrial	Mining	Other Petroleum	National

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Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
31000404	Industrial Processes, Oil and Gas Production, Process Heaters, Natural Gas	INDC1803	Industrial	Mining	Natural Gas	National
31000405	Industrial Processes, Oil and Gas Production, Process Heaters, Process Gas	PETP3101	Energy Production		Crude Oil and Natural Gas	Regional
31000411	Industrial Processes, Oil and Gas Production, Process Heaters, Distillate Oil (No. 2): Steam Generators	INDC1801	Industrial	Mining	Distillate	National
31000412	Industrial Processes, Oil and Gas Production, Process Heaters, Residual Oil: Steam Generators	INDC1805	Industrial	Mining	Residual	National
31000413	Industrial Processes, Oil and Gas Production, Process Heaters, Crude Oil: Steam Generators	INDC1804	Industrial	Mining	Other Petroleum	National
31000414	Industrial Processes, Oil and Gas Production, Process Heaters, Natural Gas: Steam Generators	INDC1803	Industrial	Mining	Natural Gas	National
31000415	Industrial Processes, Oil and Gas Production, Process Heaters, Process Gas: Steam Generators	PETP3101	Energy Production		Crude Oil and Natural Gas	Regional
31088801	Industrial Processes, Oil and Gas Production, Fugitive Emissions, Specify in Comments Field	PETP3101	Energy Production		Crude Oil and Natural Gas	Regional
31088802	Industrial Processes, Oil and Gas Production, Fugitive Emissions, Specify in Comments Field	PETP3101	Energy Production		Crude Oil and Natural Gas	Regional
31088803	Industrial Processes, Oil and Gas Production, Fugitive Emissions, Specify in Comments Field	PETP3101	Energy Production		Crude Oil and Natural Gas	Regional
31088804	Industrial Processes, Oil and Gas Production, Fugitive Emissions, Specify in Comments Field	PETP3101	Energy Production		Crude Oil and Natural Gas	Regional
31088805	Industrial Processes, Oil and Gas Production, Fugitive Emissions, Specify in Comments Field	PETP3101	Energy Production		Crude Oil and Natural Gas	Regional
31088811	Industrial Processes, Oil and Gas Production, Fugitive Emissions, Fugitive Emissions	PETP3101	Energy Production		Crude Oil and Natural Gas	Regional
31390003	Industrial Processes, Electrical Equipment, Process Heaters, Natural Gas	INDC1702	Industrial	Metals-Based Durables	Natural Gas	National
39000189	Industrial Processes, In-process Fuel Use, Anthracite Coal, General	INDC2213	Industrial	Total Industrial	Total Coal	Regional
39000199	Industrial Processes, In-process Fuel Use, Anthracite Coal, General	INDC2213	Industrial	Total Industrial	Total Coal	Regional
39000201	Industrial Processes, In-process Fuel Use, Bituminous Coal, Cement Kiln/Dryer (Bituminous Coal)	INDC1404	Industrial	Cement	Steam Coal	National
39000203	Industrial Processes, In-process Fuel Use, Bituminous Coal, Lime Kiln (Bituminous)	INDC1907	Industrial	Other Manufacturing	Steam Coal	National
39000288	Industrial Processes, In-process Fuel Use, Bituminous Coal, General (Subbituminous)	INDC2213	Industrial	Total Industrial	Total Coal	Regional
39000289	Industrial Processes, In-process Fuel Use, Bituminous Coal, General (Bituminous)	INDC2213	Industrial	Total Industrial	Total Coal	Regional
39000299	Industrial Processes, In-process Fuel Use, Bituminous Coal, General (Bituminous)	INDC2213	Industrial	Total Industrial	Total Coal	Regional
39000399	Industrial Processes, In-process Fuel Use, Lignite, General	INDC2213	Industrial	Total Industrial	Total Coal	Regional
39000402	Industrial Processes, In-process Fuel Use, Residual Oil, Cement Kiln/Dryer	INDC1403	Industrial	Cement	Residual	National
39000403	Industrial Processes, In-process Fuel Use, Residual Oil, Lime Kiln	INDC1906	Industrial	Other Manufacturing	Residual	National
39000489	Industrial Processes, In-process Fuel Use, Residual Oil, General	INDC2211	Industrial	Total Industrial	Residual	Regional
39000499	Industrial Processes, In-process Fuel Use, Residual Oil, General	INDC2211	Industrial	Total Industrial	Residual	Regional
39000501	Industrial Processes, In-process Fuel Use, Distillate Oil, Asphalt Dryer **	INDC2101	Industrial	Refining	Distillate	National
39000502	Industrial Processes, In-process Fuel Use, Distillate Oil, Cement Kiln/Dryer	INDC1401	Industrial	Cement	Distillate	National
39000503	Industrial Processes, In-process Fuel Use, Distillate Oil, Lime Kiln	INDC1901	Industrial	Other Manufacturing	Distillate	National
39000589	Industrial Processes, In-process Fuel Use, Distillate Oil, General	INDC2202	Industrial	Total Industrial	Distillate	Regional
39000598	Industrial Processes, In-process Fuel Use, Distillate Oil, Grade 4 Oil: General	INDC2202	Industrial	Total Industrial	Distillate	Regional
39000599	Industrial Processes, In-process Fuel Use, Distillate Oil, General	INDC2202	Industrial	Total Industrial	Distillate	Regional
39000602	Industrial Processes, In-process Fuel Use, Natural Gas, Cement Kiln/Dryer	INDC1402	Industrial	Cement	Natural Gas	National
39000603	Industrial Processes, In-process Fuel Use, Natural Gas, Lime Kiln	INDC1903	Industrial	Other Manufacturing	Natural Gas	National
39000605	Industrial Processes, In-process Fuel Use, Natural Gas, Metal Melting **	INDC1603	Industrial	Iron and Steel	Natural Gas	National

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
39000689	Industrial Processes, In-process Fuel Use, Natural Gas, General	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
39000698		INDC2206	Industrial	Total Industrial	Natural Gas	Regional
39000699	Industrial Processes, In-process Fuel Use, Natural Gas, General	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
39000701	Industrial Processes, In-process Fuel Use, Process Gas, Coke Oven or Blast Furnace	INDC1602	Industrial	Iron and Steel	Metallurgical Coal	National
39000702	Industrial Processes, In-process Fuel Use, Process Gas, Coke Oven Gas	INDC1602	Industrial	Iron and Steel	Metallurgical Coal	National
39000788	Industrial Processes, In-process Fuel Use, Process Gas, General	INDC2201	Industrial	Total Industrial	Delivered Energy	Regional
39000789	Industrial Processes, In-process Fuel Use, Process Gas, Coke Oven Gas	INDC1602	Industrial	Iron and Steel	Metallurgical Coal	National
39000797	Industrial Processes, In-process Fuel Use, Process Gas, General	INDC2201	Industrial	Total Industrial	Delivered Energy	Regional
39000799	Industrial Processes, In-process Fuel Use, Process Gas, General	INDC2201	Industrial	Total Industrial	Delivered Energy	Regional
39000801	Industrial Processes, In-process Fuel Use, Coke, Mineral Wool Fuel **	INDC2204	Industrial	Total Industrial	Metallurgical Coal	Regional
39000889	Industrial Processes, In-process Fuel Use, Coke, General	INDC2204	Industrial	Total Industrial	Metallurgical Coal	Regional
39000899	Industrial Processes, In-process Fuel Use, Coke, General: Coke	INDC2204	Industrial	Total Industrial	Metallurgical Coal	Regional
39000989	Industrial Processes, In-process Fuel Use, Wood, General	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
39000999	Industrial Processes, In-process Fuel Use, Wood, General: Wood	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
39001089	Industrial Processes, In-process Fuel Use, Liquified Petroleum Gas, General	INDC2203	Industrial	Total Industrial	Liquified Petroleum Gas	Regional
39001099	Industrial Processes, In-process Fuel Use, Liquified Petroleum Gas, General	INDC2203	Industrial	Total Industrial	Liquified Petroleum Gas	Regional
39001299	Industrial Processes, In-process Fuel Use, Solid Waste, General	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
39001389	Industrial Processes, In-process Fuel Use, Liquid Waste, General	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
39001399	Industrial Processes, In-process Fuel Use, Liquid Waste, General	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
39005599		INDC2202	Industrial	Total Industrial	Distillate	Regional
39010099		INDC2208	Industrial	Total Industrial	Petroleum Subtotal	Regional
39990001	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Manufacturing Industries, Distillate Oil (No. 2): Process Heaters	INDC1901	Industrial	Other Manufacturing	Distillate	National
39990002	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Manufacturing Industries, Residual Oil: Process Heaters	INDC1906	Industrial	Other Manufacturing	Residual	National
39990003	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Manufacturing Industries, Natural Gas: Process Heaters	INDC1903	Industrial	Other Manufacturing	Natural Gas	National
39990004	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Manufacturing Industries, Process Gas: Process Heaters	INDC1908	Industrial	Other Manufacturing	Total	National
39990013	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Manufacturing Industries, Natural Gas: Incinerators	INDC1903	Industrial	Other Manufacturing	Natural Gas	National
39990014	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Manufacturing Industries, Process Gas: Incinerators	INDC1908	Industrial	Other Manufacturing	Total	National
39990022	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Manufacturing Industries, Residual Oil: Flares	INDC1906	Industrial	Other Manufacturing	Residual	National
39990023	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Manufacturing Industries, Natural Gas: Flares	INDC1903	Industrial	Other Manufacturing	Natural Gas	National
39990024	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Manufacturing Industries, Process Gas: Flares	INDC1908	Industrial	Other Manufacturing	Total	National
39991013		INDC1903	Industrial	Other Manufacturing	Natural Gas	National
40201001	Petroleum and Solvent Evaporation, Surface Coating Operations, Coating Oven Heater, Natural Gas	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
40201002	Petroleum and Solvent Evaporation, Surface Coating Operations, Coating Oven Heater, Distillate Oil	INDC2202	Industrial	Total Industrial	Distillate	Regional
40201003	Petroleum and Solvent Evaporation, Surface Coating Operations, Coating Oven Heater, Residual Oil	INDC2211	Industrial	Total Industrial	Residual	Regional
40201004	Petroleum and Solvent Evaporation, Surface Coating Operations, Coating Oven Heater, Liquified Petroleum Gas (LPG)	INDC2203	Industrial	Total Industrial	Liquified Petroleum Gas	Regional

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
40290011	Petroleum and Solvent Evaporation, Surface Coating Operations, Fuel Fired Equipment, Distillate Oil: Incinerator/Afterburner	INDC2202	Industrial	Total Industrial	Distillate	Regional
40290013	Petroleum and Solvent Evaporation, Surface Coating Operations, Fuel Fired Equipment, Natural Gas: Incinerator/Afterburner	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
40290023	Petroleum and Solvent Evaporation, Surface Coating Operations, Fuel Fired Equipment, Natural Gas: Flares	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
40300101	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Gasoline **	PETS3001	Energy Production		Refined Petroleum Products	National
40300102	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Crude **	PETS3001	Energy Production		Refined Petroleum Products	National
40300103	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Gasoline **	PETS3001	Energy Production		Refined Petroleum Products	National
40300104	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Crude **	PETS3001	Energy Production		Refined Petroleum Products	National
40300105	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Jet Fuel **	PETS3001	Energy Production		Refined Petroleum Products	National
40300106	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Kerosene **	PETS3001	Energy Production		Refined Petroleum Products	National
40300107	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Dist Fuel **	PETS3001	Energy Production		Refined Petroleum Products	National
40300108	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Benzene **	PETS3001	Energy Production		Refined Petroleum Products	National
40300109	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Cyclohexane **	PETS3001	Energy Production		Refined Petroleum Products	National
40300111	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Heptane **	PETS3001	Energy Production		Refined Petroleum Products	National
40300112	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Hexane **	PETS3001	Energy Production		Refined Petroleum Products	National
40300115	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Pentane **	PETS3001	Energy Production		Refined Petroleum Products	National
40300116	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Toluene **	PETS3001	Energy Production		Refined Petroleum Products	National
40300150	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Jet Fuel **	PETS3001	Energy Production		Refined Petroleum Products	National
40300151	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Kerosene **	PETS3001	Energy Production		Refined Petroleum Products	National
40300152	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Dist Fuel **	PETS3001	Energy Production		Refined Petroleum Products	National
40300153	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Benzene **	PETS3001	Energy Production		Refined Petroleum Products	National
40300154	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Cyclohexane **	PETS3001	Energy Production		Refined Petroleum Products	National

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Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
40300156	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Heptane **	PETS3001	Energy Production		Refined Petroleum Products	National
40300157	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Hexane **	PETS3001	Energy Production		Refined Petroleum Products	National
40300159	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Isopentane **	PETS3001	Energy Production		Refined Petroleum Products	National
40300160	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Pentane **	PETS3001	Energy Production		Refined Petroleum Products	National
40300161	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), Toluene **	PETS3001	Energy Production		Refined Petroleum Products	National
40300197		PETS3001	Energy Production		Refined Petroleum Products	National
40300198	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), See Comment **	PETS3001	Energy Production		Refined Petroleum Products	National
40300199	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-010 and 4-07), See Comment **	PETS3001	Energy Production		Refined Petroleum Products	National
40300201	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-011 and 4-07), Gasoline **	PETS3001	Energy Production		Refined Petroleum Products	National
40300202	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-011 and 4-07), Product **	PETS3001	Energy Production		Refined Petroleum Products	National
40300203	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-011 and 4-07), Crude **	PETS3001	Energy Production		Refined Petroleum Products	National
40300204	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-011 and 4-07), Crude **	PETS3001	Energy Production		Refined Petroleum Products	National
40300205	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-011 and 4-07), Jet Fuel **	PETS3001	Energy Production		Refined Petroleum Products	National
40300207	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-011 and 4-07), Dist Fuel **	PETS3001	Energy Production		Refined Petroleum Products	National
40300208	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-011 and 4-07), Benzene **	PETS3001	Energy Production		Refined Petroleum Products	National
40300209	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-011 and 4-07), Cyclohexane **	PETS3001	Energy Production		Refined Petroleum Products	National
40300210	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-011 and 4-07), Cyclopentane **	PETS3001	Energy Production		Refined Petroleum Products	National
40300212	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-011 and 4-07), Hexane **	PETS3001	Energy Production		Refined Petroleum Products	National
40300216	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-011 and 4-07), Toluene **	PETS3001	Energy Production		Refined Petroleum Products	National
40300299	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-011 and 4-07), Specify Liquid **	PETS3001	Energy Production		Refined Petroleum Products	National

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Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
40300302	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Deleted - Do Not Use (See 4-03-011 and 4-07), Gasoline **	PETS3001	Energy Production		Refined Petroleum Products	National
40301001	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Gasoline RVP 13: Breathing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301002	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Gasoline RVP 10: Breathing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301003	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Gasoline RVP 7: Breathing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301004	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Gasoline RVP 13: Breathing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301005	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Gasoline RVP 10: Breathing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301006	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Gasoline RVP 7: Breathing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301007	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Gasoline RVP 13: Working Loss (Tank Diameter Independent)	PETS3001	Energy Production		Refined Petroleum Products	National
40301008	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Gasoline RVP 10: Working Loss (Tank Diameter Independent)	PETS3001	Energy Production		Refined Petroleum Products	National
40301009	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Gasoline RVP 7: Working Loss (Tank Diameter Independent)	PETS3001	Energy Production		Refined Petroleum Products	National
40301010	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Crude Oil RVP 5: Breathing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301011	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Crude Oil RVP 5: Breathing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301012	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Crude Oil RVP 5: Working Loss (Tank Diameter Independent)	PETS3001	Energy Production		Refined Petroleum Products	National
40301013	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Jet Naphtha (JP-4): Breathing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301014	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Jet Naphtha (JP-4): Breathing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301015	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Jet Naphtha (JP-4): Working Loss (Tank Diameter Independent)	PETS3001	Energy Production		Refined Petroleum Products	National
40301016	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Jet Kerosene: Breathing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301017	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Jet Kerosene: Breathing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301018	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Jet Kerosene: Working Loss (Tank Diameter Independent)	PETS3001	Energy Production		Refined Petroleum Products	National
40301019	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Distillate Fuel #2: Breathing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
40301020	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Distillate Fuel #2: Breathing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301021	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Distillate Fuel #2: Working Loss (Tank Diameter Independent)	PETS3001	Energy Production		Refined Petroleum Products	National
40301068	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Grade 2 Fuel Oil: Breathing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301078	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Grade 2 Fuel Oil: Working Loss (Independent Tank Diameter)	PETS3001	Energy Production		Refined Petroleum Products	National
40301097	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Specify Liquid: Breathing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301098	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Specify Liquid: Breathing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301099	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fixed Roof Tanks (Varying Sizes), Specify Liquid: Working Loss (Tank Diameter Independent)	PETS3001	Energy Production		Refined Petroleum Products	National
40301101	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Gasoline RVP 13: Standing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301102	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Gasoline RVP 10: Standing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301103	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Gasoline RVP 7: Standing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301104	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Gasoline RVP 13: Standing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301105	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Gasoline RVP 10: Standing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301106	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Gasoline RVP 7: Standing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301107	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Gasoline RVP 13/10/7: Withdrawal Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301108	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Gasoline RVP 13/10/7: Withdrawal Loss (250000 Bbl.Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301109	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Crude Oil RVP 5: Standing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301110	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Crude Oil RVP 5: Standing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301111	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Jet Naphtha (JP-4): Standing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301112	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Jet Naphtha (JP-4): Standing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301113	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Jet Kerosene: Standing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National

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Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
40301114	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Jet Kerosene: Standing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301115	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Distillate Fuel #2: Standing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301116	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Distillate Fuel #2: Standing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301117	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Crude Oil RVP 5: Withdrawal Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40301118	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Jet Naphtha (JP-4): Withdrawal Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40301119	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Jet Kerosene: Withdrawal Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40301120	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Distillate Fuel #2: Withdrawal Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40301130	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Specify Liquid: Standing Loss - External - Primary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40301131	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Gasoline: Standing Loss - External - Primary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40301132	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Crude Oil: Standing Loss - External - Primary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40301133	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Jet Naphtha (JP-4): Standing Loss - External - Primary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40301134	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Jet Kerosene: Standing Loss - External - Primary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40301135	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Distillate Fuel #2: Standing Loss - External - Primary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40301140	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Specify Liquid: Standing Loss - External - Secondary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40301141	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Gasoline: Standing Loss - External - Secondary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40301142	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Crude Oil: Standing Loss - External - Secondary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40301143	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Jet Naphtha (JP-4): Standing Loss - External - Secondary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40301144	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Jet Kerosene: Standing Loss - External - Secondary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40301145	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Distillate Fuel #2: Standing Loss - External - Secondary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40301150	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Specify Liquid: Standing Loss - Internal	PETS3001	Energy Production		Refined Petroleum Products	National

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
40301151	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Gasoline: Standing Loss - Internal	PETS3001	Energy Production		Refined Petroleum Products	National
40301152	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Crude Oil: Standing Loss - Internal	PETS3001	Energy Production		Refined Petroleum Products	National
40301153	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Jet Naphtha (JP-4): Standing Loss - Internal	PETS3001	Energy Production		Refined Petroleum Products	National
40301154	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Jet Kerosene: Standing Loss - Internal	PETS3001	Energy Production		Refined Petroleum Products	National
40301155	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Distillate Fuel #2: Standing Loss - Internal	PETS3001	Energy Production		Refined Petroleum Products	National
40301197	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Specify Liquid: Withdrawal Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40301198	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Specify Liquid: Standing Loss (67000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301199	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Floating Roof Tanks (Varying Sizes), Specify Liquid: Standing Loss (250000 Bbl. Tank Size)	PETS3001	Energy Production		Refined Petroleum Products	National
40301201	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Variable Vapor Space, Gasoline RVP 13: Filling Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40301202	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Variable Vapor Space, Gasoline RVP 10: Filling Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40301203	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Variable Vapor Space, Gasoline RVP 7: Filling Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40301204	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Variable Vapor Space, Jet Naphtha (JP-4): Filling Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40301205	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Variable Vapor Space, Jet Kerosene: Filling Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40301206	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Variable Vapor Space, Distillate Fuel #2: Filling Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40301299	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Variable Vapor Space, Specify Liquid: Filling Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40388801	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National
40388802	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National
40388803	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National
40388804	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National
40388805	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National

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			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
40399999	Petroleum and Solvent Evaporation, Petroleum Product Storage at Refineries, Other Not Classified, See Comment **	PETS3001	Energy Production		Refined Petroleum Products	National
40400101	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 13: Breathing Loss (67000 Bbl Capacity) - Fixed Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400102	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 10: Breathing Loss (67000 Bbl Capacity) - Fixed Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400103	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 7: Breathing Loss (67000 Bbl. Capacity) - Fixed Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400104	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 13: Breathing Loss (250000 Bbl Capacity)-Fixed Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400105	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 10: Breathing Loss (250000 Bbl Capacity)-Fixed Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400106	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 7: Breathing Loss (250000 Bbl Capacity) - Fixed Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400107	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 13: Working Loss (Diam. Independent) - Fixed Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400108	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 10: Working Loss (Diameter Independent) - Fixed Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400109	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 7: Working Loss (Diameter Independent) - Fixed Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400110	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 13: Standing Loss (67000 Bbl Capacity)-Floating Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400111	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 10: Standing Loss (67000 Bbl Capacity)-Floating Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400112	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 7: Standing Loss (67000 Bbl Capacity)- Floating Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400113	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 13: Standing Loss (250000 Bbl Cap.) - Floating Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400114	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 10: Standing Loss (250000 Bbl Cap.) - Floating Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400115	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 7: Standing Loss (250000 Bbl Cap.) - Floating Roof Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40400116	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 13/10/7: Withdrawal Loss (67000 Bbl Cap.) - Float Rf Tnk	PETS3001	Energy Production		Refined Petroleum Products	National
40400117	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 13/10/7: Withdrawal Loss (250000 Bbl Cap.) - Float Rf Tnk	PETS3001	Energy Production		Refined Petroleum Products	National
40400118	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 13: Filling Loss (10500 Bbl Cap.) - Variable Vapor Space	PETS3001	Energy Production		Refined Petroleum Products	National
40400119	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 10: Filling Loss (10500 Bbl Cap.) - Variable Vapor Space	PETS3001	Energy Production		Refined Petroleum Products	National

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Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
40400120	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 7: Filling Loss (10500 Bbl Cap.) - Variable Vapor Space	PETS3001	Energy Production		Refined Petroleum Products	National
40400130	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Specify Liquid: Standing Loss - External Floating Roof w/ Primary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40400131	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 13: Standing Loss - Ext. Floating Roof w/ Primary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40400140	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Specify Liquid: Standing Loss - Ext. Float Roof Tank w/ Second'y Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40400141	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 13: Standing Loss - Ext. Floating Roof w/ Secondary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40400150	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Miscellaneous Losses/Leaks: Loading Racks	PETS3001	Energy Production		Refined Petroleum Products	National
40400151	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Valves, Flanges, and Pumps	PETS3001	Energy Production		Refined Petroleum Products	National
40400152	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Vapor Collection Losses	PETS3001	Energy Production		Refined Petroleum Products	National
40400153	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Vapor Control Unit Losses	PETS3001	Energy Production		Refined Petroleum Products	National
40400154	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Tank Truck Vapor Leaks	PETS3001	Energy Production		Refined Petroleum Products	National
40400160	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Specify Liquid: Standing Loss - Internal Floating Roof w/ Primary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40400161	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 13: Standing Loss - Int. Floating Roof w/ Primary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40400170	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Specify Liquid: Standing Loss - Int. Floating Roof w/ Secondary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40400171	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 13: Standing Loss - Int. Floating Roof w/ Secondary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40400178	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, Gasoline RVP 13/10/7: Withdrawal Loss - Int. Float Roof (Pri/Sec Seal)	PETS3001	Energy Production		Refined Petroleum Products	National
40400199	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Terminals, See Comment **	PETS3001	Energy Production		Refined Petroleum Products	National
40400201	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 13: Breathing Loss (67000 Bbl Capacity) - Fixed Roof Tank	TRAN4001	Transportation		Motor Gasoline	Regional
40400202	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 10: Breathing Loss (67000 Bbl Capacity) - Fixed Roof Tank	TRAN4001	Transportation		Motor Gasoline	Regional
40400203	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 7: Breathing Loss (67000 Bbl. Capacity) - Fixed Roof Tank	TRAN4001	Transportation		Motor Gasoline	Regional
40400204	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 13: Working Loss (67000 Bbl. Capacity) - Fixed Roof Tank	TRAN4001	Transportation		Motor Gasoline	Regional

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Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
40400205	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 10: Working Loss (67000 Bbl. Capacity) - Fixed Roof Tank	TRAN4001	Transportation		Motor Gasoline	Regional
40400206	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 7: Working Loss (67000 Bbl. Capacity) - Fixed Roof Tank	TRAN4001	Transportation		Motor Gasoline	Regional
40400207	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 13: Standing Loss (67000 Bbl Cap.) - Floating Roof Tank	TRAN4001	Transportation		Motor Gasoline	Regional
40400208	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 10: Standing Loss (67000 Bbl Cap.) - Floating Roof Tank	TRAN4001	Transportation		Motor Gasoline	Regional
40400209	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 7: Standing Loss (67000 Bbl Cap.) - Floating Roof Tank	TRAN4001	Transportation		Motor Gasoline	Regional
40400210	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 13/10/7: Withdrawal Loss (67000 Bbl Cap.) - Float Rf Tnk	TRAN4001	Transportation		Motor Gasoline	Regional
40400211	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 13: Filling Loss (10500 Bbl Cap.) - Variable Vapor Space	TRAN4001	Transportation		Motor Gasoline	Regional
40400212	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 10: Filling Loss (10500 Bbl Cap.) - Variable Vapor Space	TRAN4001	Transportation		Motor Gasoline	Regional
40400230	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Specify Liquid: Standing Loss - External Floating Roof w/ Primary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40400231	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 13: Standing Loss - Ext. Floating Roof w/ Primary Seal	TRAN4001	Transportation		Motor Gasoline	Regional
40400240	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Specify Liquid: Standing Loss - Ext. Floating Roof w/ Secondary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40400241	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 13: Standing Loss - Ext. Floating Roof w/ Secondary Seal	TRAN4001	Transportation		Motor Gasoline	Regional
40400250	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Loading Racks	PETS3001	Energy Production		Refined Petroleum Products	National
40400251	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Valves, Flanges, and Pumps	PETS3001	Energy Production		Refined Petroleum Products	National
40400254	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Tank Truck Vapor Losses	PETS3001	Energy Production		Refined Petroleum Products	National
40400260	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Specify Liquid: Standing Loss - Internal Floating Roof w/ Primary Seal	PETS3001	Energy Production		Refined Petroleum Products	National
40400261	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 13: Standing Loss - Int. Floating Roof w/ Primary Seal	TRAN4001	Transportation		Motor Gasoline	Regional
40400271	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Bulk Plants, Gasoline RVP 13: Standing Loss - Int. Floating Roof w/ Secondary Seal	TRAN4001	Transportation		Motor Gasoline	Regional
40400298		PETS3001	Energy Production		Refined Petroleum Products	National
40400401	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Petroleum Products - Underground Tanks, Gasoline RVP 13: Breathing Loss	TRAN4001	Transportation		Motor Gasoline	Regional

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			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
40400402	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Petroleum Products - Underground Tanks, Gasoline RVP 13: Working Loss	TRAN4001	Transportation		Motor Gasoline	Regional
40400403	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Petroleum Products - Underground Tanks, Gasoline RVP 10: Breathing Loss	TRAN4001	Transportation		Motor Gasoline	Regional
40400404	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Petroleum Products - Underground Tanks, Gasoline RVP 10: Working Loss	TRAN4001	Transportation		Motor Gasoline	Regional
40400405	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Petroleum Products - Underground Tanks, Gasoline RVP 7: Breathing Loss	TRAN4001	Transportation		Motor Gasoline	Regional
40400406	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Petroleum Products - Underground Tanks, Gasoline RVP 7: Working Loss	TRAN4001	Transportation		Motor Gasoline	Regional
40400407	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Petroleum Products - Underground Tanks, Crude Oil RVP 5: Breathing Loss	PETP3106	Energy Production		Crude Oil	Regional
40400408	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Petroleum Products - Underground Tanks, Crude Oil RVP 5: Working Loss	PETP3106	Energy Production		Crude Oil	Regional
40400413	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Petroleum Products - Underground Tanks, Distillate Fuel #2: Breathing Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40400414	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Petroleum Products - Underground Tanks, Distillate Fuel #2: Working Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40400497	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Petroleum Products - Underground Tanks, Specify Liquid: Breathing Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40400498	Petroleum and Solvent Evaporation, Petroleum Liquids Storage (non-Refinery), Petroleum Products - Underground Tanks, Specify Liquid: Working Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40400815		PETS3001	Energy Production		Refined Petroleum Products	National
40600101	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Gasoline: Splash Loading **	TRAN4001	Transportation		Motor Gasoline	Regional
40600126	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Gasoline: Submerged Loading **	TRAN4001	Transportation		Motor Gasoline	Regional
40600131	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Gasoline: Submerged Loading (Normal Service)	TRAN4001	Transportation		Motor Gasoline	Regional
40600132	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Crude Oil: Submerged Loading (Normal Service)	PETS3001	Energy Production		Refined Petroleum Products	National
40600136	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Gasoline: Splash Loading (Normal Service)	TRAN4001	Transportation		Motor Gasoline	Regional
40600137	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Crude Oil: Splash Loading (Normal Service)	PETS3001	Energy Production		Refined Petroleum Products	National
40600141	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Gasoline: Submerged Loading (Balanced Service)	TRAN4001	Transportation		Motor Gasoline	Regional
40600142	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Crude Oil: Submerged Loading (Balanced Service)	PETS3001	Energy Production		Refined Petroleum Products	National

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			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
40600144	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Gasoline: Splash Loading (Balanced Service)	TRAN4001	Transportation		Motor Gasoline	Regional
40600145	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Crude Oil: Splash Loading (Balanced Service)	PETS3001	Energy Production		Refined Petroleum Products	National
40600147	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Gasoline: Submerged Loading (Clean Tanks)	TRAN4001	Transportation		Motor Gasoline	Regional
40600148	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Crude Oil: Submerged Loading (Clean Tanks)	PETS3001	Energy Production		Refined Petroleum Products	National
40600162	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Gasoline: Loaded with Fuel (Transit Losses)	TRAN4001	Transportation		Motor Gasoline	Regional
40600163	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Gasoline: Return with Vapor (Transit Losses)	TRAN4001	Transportation		Motor Gasoline	Regional
40600197	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Not Classified **	PETS3001	Energy Production		Refined Petroleum Products	National
40600198	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Not Classified **	PETS3001	Energy Production		Refined Petroleum Products	National
40600199	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Tank Cars and Trucks, Not Classified **	PETS3001	Energy Production		Refined Petroleum Products	National
40600231	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Gasoline: Ship Loading - Cleaned and Vapor Free Tanks	PETS3001	Energy Production		Refined Petroleum Products	National
40600232	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Gasoline: Ocean Barges Loading	PETS3001	Energy Production		Refined Petroleum Products	National
40600233	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Gasoline: Barge Loading - Cleaned and Vapor Free Tanks	PETS3001	Energy Production		Refined Petroleum Products	National
40600234	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Gasoline: Ship Loading - Ballasted Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40600235	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Gasoline: Ocean Barges Loading - Ballasted Tank	PETS3001	Energy Production		Refined Petroleum Products	National
40600236	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Gasoline: Ship Loading - Uncleaned Tanks	PETS3001	Energy Production		Refined Petroleum Products	National
40600237	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Gasoline: Ocean Barges Loading - Uncleaned Tanks	PETS3001	Energy Production		Refined Petroleum Products	National
40600238	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Gasoline: Barges Loading - Uncleaned Tanks	PETS3001	Energy Production		Refined Petroleum Products	National
40600239	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Gasoline: Tanker Ship - Ballasted Tank Condition	PETS3001	Energy Production		Refined Petroleum Products	National
40600240	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Gasoline: Barge Loading - Average Tank Condition	PETS3001	Energy Production		Refined Petroleum Products	National
40600242	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Gasoline: Transit Loss	PETS3001	Energy Production		Refined Petroleum Products	National

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
40600243	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Crude Oil: Loading Tankers	PETS3001	Energy Production		Refined Petroleum Products	National
40600244	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Jet Fuel: Loading Tankers	PETS3001	Energy Production		Refined Petroleum Products	National
40600245	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Kerosene: Loading Tankers	PETS3001	Energy Production		Refined Petroleum Products	National
40600246	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Distillate Oil: Loading Tankers	PETS3001	Energy Production		Refined Petroleum Products	National
40600248	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Crude Oil: Loading Barges	PETS3001	Energy Production		Refined Petroleum Products	National
40600249	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Jet Fuel: Loading Barges	PETS3001	Energy Production		Refined Petroleum Products	National
40600250	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Kerosene: Loading Barges	PETS3001	Energy Production		Refined Petroleum Products	National
40600251	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Distillate Oil: Loading Barges	PETS3001	Energy Production		Refined Petroleum Products	National
40600253	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Crude Oil: Tanker Ballasting	PETS3001	Energy Production		Refined Petroleum Products	National
40600254	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Crude Oil: Transit Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40600257	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Distillate Oil: Transit Loss	PETS3001	Energy Production		Refined Petroleum Products	National
40600259	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Tanker/Barge Cleaning	PETS3001	Energy Production		Refined Petroleum Products	National
40600298	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Not Classified **	PETS3001	Energy Production		Refined Petroleum Products	National
40600299	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Marine Vessels, Not Classified **	PETS3001	Energy Production		Refined Petroleum Products	National
40600301	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Gasoline Retail Operations - Stage I, Splash Filling	TRAN4001	Transportation		Motor Gasoline	Regional
40600302	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Gasoline Retail Operations - Stage I, Submerged Filling w/o Controls	TRAN4001	Transportation		Motor Gasoline	Regional
40600306	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Gasoline Retail Operations - Stage I, Balanced Submerged Filling	TRAN4001	Transportation		Motor Gasoline	Regional
40600307	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Gasoline Retail Operations - Stage I, Underground Tank Breathing and Emptying	TRAN4001	Transportation		Motor Gasoline	Regional
40600399	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Gasoline Retail Operations - Stage I, Not Classified **	TRAN4001	Transportation		Motor Gasoline	Regional
40600401	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Filling Vehicle Gas Tanks - Stage II, Vapor Loss w/o Controls	TRAN4001	Transportation		Motor Gasoline	Regional

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
40600402	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Filling Vehicle Gas Tanks - Stage II, Liquid Spill Loss w/o Controls	TRAN4001	Transportation		Motor Gasoline	Regional
40600403	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Filling Vehicle Gas Tanks - Stage II, Vapor Loss w/o Controls	TRAN4001	Transportation		Motor Gasoline	Regional
40600499	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Filling Vehicle Gas Tanks - Stage II, Not Classified **	TRAN4001	Transportation		Motor Gasoline	Regional
40688801	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National
40688802	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National
40688803	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National
40688804	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National
40688805	Petroleum and Solvent Evaporation, Transportation and Marketing of Petroleum Products, Fugitive Emissions, Specify in Comments Field	PETS3001	Energy Production		Refined Petroleum Products	National
49090011	Petroleum and Solvent Evaporation, Organic Solvent Evaporation, Fuel Fired Equipment, Distillate Oil (No. 2): Incinerators	INDC2202	Industrial	Total Industrial	Distillate	Regional
49090013	Petroleum and Solvent Evaporation, Organic Solvent Evaporation, Fuel Fired Equipment, Natural Gas: Incinerators	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
49090023	Petroleum and Solvent Evaporation, Organic Solvent Evaporation, Fuel Fired Equipment, Natural Gas: Flares	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
50100103	Waste Disposal, Solid Waste Disposal - Government, Municipal Incineration, Refuse Derived Fuel	COMC1109	Commercial		Renewable Energy	Regional
50190005	Waste Disposal, Solid Waste Disposal - Government, Auxillary Fuel/No Emissions, Distillate Oil	COMC1103	Commercial		Distillate	Regional
50190006	Waste Disposal, Solid Waste Disposal - Government, Auxillary Fuel/No Emissions, Natural Gas	COMC1107	Commercial		Natural Gas	Regional
50190010	Waste Disposal, Solid Waste Disposal - Government, Auxillary Fuel/No Emissions, Liquified Petroleum Gas (LPG)	COMC1105	Commercial		Liquified Petroleum Gas	Regional
50200601	Waste Disposal, Solid Waste Disposal - Commercial/Institutional, Landfill Dump, Waste Gas Flares ** (Use 5-01-004-10)	COMC1109	Commercial		Renewable Energy	Regional
50290005	Waste Disposal, Solid Waste Disposal - Commercial/Institutional, Auxillary Fuel/No Emissions, Distillate Oil	COMC1103	Commercial		Distillate	Regional
50290006	Waste Disposal, Solid Waste Disposal - Commercial/Institutional, Auxillary Fuel/No Emissions, Natural Gas	COMC1107	Commercial		Natural Gas	Regional
50290010	Waste Disposal, Solid Waste Disposal - Commercial/Institutional, Auxillary Fuel/No Emissions, Liquified Petroleum Gas (LPG)	COMC1105	Commercial		Liquified Petroleum Gas	Regional
50290099		COMC1102	Commercial		Delivered Energy	Regional
50300601	Waste Disposal, Solid Waste Disposal - Industrial, Landfill Dump, Waste Gas Flares	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
50390005	Waste Disposal, Solid Waste Disposal - Industrial, Auxillary Fuel/No Emissions, Distillate Oil	INDC2202	Industrial	Total Industrial	Distillate	Regional
50390006	Waste Disposal, Solid Waste Disposal - Industrial, Auxillary Fuel/No Emissions, Natural Gas	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
50390007	Waste Disposal, Solid Waste Disposal - Industrial, Auxillary Fuel/No Emissions, Process Gas	INDC2201	Industrial	Total Industrial	Delivered Energy	Regional
50390010	Waste Disposal, Solid Waste Disposal - Industrial, Auxillary Fuel/No Emissions, Liquified Petroleum Gas (LPG)	INDC2203	Industrial	Total Industrial	Liquified Petroleum Gas	Regional
2102001000	Stationary Source Fuel Combustion, Industrial, Anthracite Coal, Total: All Boiler Types	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
2102002000	Stationary Source Fuel Combustion, Industrial, Bituminous/Subbituminous Coal, Total: All Boiler Types	INDC2212	Industrial	Total Industrial	Steam Coal	Regional
2102004000	Stationary Source Fuel Combustion, Industrial, Distillate Oil, Total: Boilers and IC Engines	INDC2202	Industrial	Total Industrial	Distillate	Regional
2102005000	Stationary Source Fuel Combustion, Industrial, Residual Oil, Total: All Boiler Types	INDC2211	Industrial	Total Industrial	Residual	Regional

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
2102006000	Stationary Source Fuel Combustion, Industrial, Natural Gas, Total: Boilers and IC Engines	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
2102006001	Stationary Source Fuel Combustion, Industrial, Natural Gas, All Boiler Types	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
2102006002	Stationary Source Fuel Combustion, Industrial, Natural Gas, All IC Engine Types	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
2102007000	Stationary Source Fuel Combustion, Industrial, Liquified Petroleum Gas (LPG), Total: All Boiler Types	INDC2203	Industrial	Total Industrial	Liquified Petroleum Gas	Regional
2102008000	Stationary Source Fuel Combustion, Industrial, Wood, Total: All Boiler Types	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
2102009000	Stationary Source Fuel Combustion, Industrial, Coke, Total: All Boiler Types	INDC2207	Industrial	Total Industrial	Other Petroleum	Regional
2102010000	Stationary Source Fuel Combustion, Industrial, Process Gas, Total: All Boiler Types	INDC2201	Industrial	Total Industrial	Delivered Energy	Regional
2102011000	Stationary Source Fuel Combustion, Industrial, Kerosene, Total: All Boiler Types	INDC2207	Industrial	Total Industrial	Other Petroleum	Regional
2103001000	Stationary Source Fuel Combustion, Commercial/Institutional, Anthracite Coal, Total: All Boiler Types	COMC1101	Commercial		Coal	Regional
2103002000	Stationary Source Fuel Combustion, Commercial/Institutional, Bituminous/Subbituminous Coal, Total: All Boiler Types	COMC1101	Commercial		Coal	Regional
2103004000	Stationary Source Fuel Combustion, Commercial/Institutional, Distillate Oil, Total: Boilers and IC Engines	COMC1103	Commercial		Distillate	Regional
2103005000	Stationary Source Fuel Combustion, Commercial/Institutional, Residual Oil, Total: All Boiler Types	COMC1110	Commercial		Residual	Regional
2103006000	Stationary Source Fuel Combustion, Commercial/Institutional, Natural Gas, Total: Boilers and IC Engines	COMC1107	Commercial		Natural Gas	Regional
2103007000	Stationary Source Fuel Combustion, Commercial/Institutional, Liquified Petroleum Gas (LPG), Total: All Combustor Types	COMC1105	Commercial		Liquified Petroleum Gas	Regional
2103008000	Stationary Source Fuel Combustion, Commercial/Institutional, Wood, Total: All Boiler Types	COMC1109	Commercial		Renewable Energy	Regional
2103011000	Stationary Source Fuel Combustion, Commercial/Institutional, Kerosene, Total: All Combustor Types	COMC1104	Commercial		Kerosene	Regional
2104001000	Stationary Source Fuel Combustion, Residential, Anthracite Coal, Total: All Combustor Types	RESC2401	Residential		Coal	Regional
2104002000	Stationary Source Fuel Combustion, Residential, Bituminous/Subbituminous Coal, Total: All Combustor Types	RESC2401	Residential		Coal	Regional
2104004000	Stationary Source Fuel Combustion, Residential, Distillate Oil, Total: All Combustor Types	RESC2403	Residential		Distillate	Regional
2104005000	Stationary Source Fuel Combustion, Residential, Residual Oil, Total: All Combustor Types	RESC2407	Residential		Petroleum Subtotal	Regional
2104006000	Stationary Source Fuel Combustion, Residential, Natural Gas, Total: All Combustor Types	RESC2406	Residential		Natural Gas	Regional
2104006010	Stationary Source Fuel Combustion : Residential : Natural Gas : Residential Furnaces	RESC2406	Residential		Natural Gas	Regional
2104007000	Stationary Source Fuel Combustion, Residential, Liquified Petroleum Gas (LPG), Total: All Combustor Types	RESC2405	Residential		Liquified Petroleum Gas	Regional
2104009000	Stationary Source Fuel Combustion : Residential : Firelog : Total: All Combustor Types	RESC2408	Residential		Renewable Energy	Regional
2104011000	Stationary Source Fuel Combustion, Residential, Kerosene, Total: All Heater Types	RESC2404	Residential		Kerosene	Regional
2199004000	Stationary Source Fuel Combustion, Total Area Source Fuel Combustion, Distillate Oil, Total: Boilers and IC Engines	TTRC2601	Total Energy - Transportation		Distillate Fuel	Regional
2199005000	Stationary Source Fuel Combustion, Total Area Source Fuel Combustion, Residual Oil, Total: All Boiler Types	TOTC2507	Total Energy		Residual Fuel	Regional
2199006000	Stationary Source Fuel Combustion, Total Area Source Fuel Combustion, Natural Gas, Total: Boilers and IC Engines	TOTC2504	Total Energy		Natural Gas	Regional
2199007000	Stationary Source Fuel Combustion, Total Area Source Fuel Combustion, Liquified Petroleum Gas (LPG), Total: All Boiler Types	TOTC2502	Total Energy		Liquified Petroleum Gas	Regional
2199011000	Stationary Source Fuel Combustion, Total Area Source Fuel Combustion, Kerosene, Total: All Heater Types	TOTC2501	Total Energy		Kerosene	Regional
2275900000	Mobile Sources, Aircraft, Refueling: All Fuels, All Processes	TRAN4002	Transportation		Jet Fuel	Regional
2275900101	Mobile Sources, Aircraft, Refueling: All Fuels, Displacement Loss/Uncontrolled	TRAN4002	Transportation		Jet Fuel	Regional
2275900102	Mobile Sources, Aircraft, Refueling: All Fuels, Displacement Loss/Controlled	TRAN4002	Transportation		Jet Fuel	Regional
2280000000	Mobile Sources, Marine Vessels, Commercial, All Fuels, Total, All Vessel Types	TRAN4006	Domestic Shipping		Total	National
2280001000	Mobile Sources, Marine Vessels, Commercial, Coal, Total, All Vessel Types	TRAN4006	Domestic Shipping		Total	National

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
2280002100	Mobile Sources , Marine Vessels, Commercial , Diesel , Port emissions	TRAN4004	Domestic Shipping		Distillate Fuel	National
2280002200	Mobile Sources , Marine Vessels, Commercial , Diesel , Underway emissions	TRAN4004	Domestic Shipping		Distillate Fuel	National
2280003000	Mobile Sources, Marine Vessels, Commercial, Residual, Total, All Vessel Types	TRAN4005	Domestic Shipping		Residual	National
2280003010	Mobile Sources, Marine Vessels, Commercial, Residual, Ocean-going Vessels	TRAN4005	Domestic Shipping		Residual	National
2280003020	Mobile Sources, Marine Vessels, Commercial, Residual, Harbor Vessels	TRAN4005	Domestic Shipping		Residual	National
2280003030	Mobile Sources, Marine Vessels, Commercial, Residual, Fishing Vessels	TRAN4005	Domestic Shipping		Residual	National
2280004020	Mobile Sources, Marine Vessels, Commercial, Gasoline, Harbor Vessels	TRAN4006	Domestic Shipping		Total	National
2285002006	Mobile Sources , Railroad Equipment , Diesel , Line Haul Locomotives: Class I Operations	TRAN4003	Freight Rail		Distillate Fuel	National
2285002007	Mobile Sources , Railroad Equipment , Diesel , Line Haul Locomotives: Class II / III Operations	TRAN4003	Freight Rail		Distillate Fuel	National
2285002010	Mobile Sources, Railroad Equipment, Diesel, Yard Locomotives	TRAN4003	Freight Rail		Distillate Fuel	National
2310000000	Industrial Processes, Oil and Gas Production: SIC 13, All Processes, Total: All Processes	PETP3101	Energy Production		Crude Oil and Natural Gas	Regional
2310010000	Industrial Processes, Oil and Gas Production: SIC 13, Crude Petroleum, Total: All Processes	PETP3106	Energy Production		Crude Oil	Regional
2310020000	Industrial Processes, Oil and Gas Production: SIC 13, Natural Gas, Total: All Processes	PETP3104	Energy Production		Natural Gas	Regional
2310030000	Industrial Processes, Oil and Gas Production: SIC 13, Natural Gas Liquids, Total: All Processes	PETP3105	Energy Production		Natural Gas Liquids	Regional
2390004000	Industrial Processes, In-process Fuel Use, Distillate Oil, Total	INDC2202	Industrial	Total Industrial	Distillate	Regional
2390005000	Industrial Processes, In-process Fuel Use, Residual Oil, Total	INDC2211	Industrial	Total Industrial	Residual	Regional
2390006000	Industrial Processes, In-process Fuel Use, Natural Gas, Total	INDC2206	Industrial	Total Industrial	Natural Gas	Regional
2390007000	Industrial Processes, In-process Fuel Use, Liquified Petroleum Gas (LPG), Total	INDC2203	Industrial	Total Industrial	Liquified Petroleum Gas	Regional
2390008000	Industrial Processes : In-process Fuel Use : Wood : Total	INDC2210	Industrial	Total Industrial	Renewable Energy	Regional
2390010000	Industrial Processes, In-process Fuel Use, Process Gas, Total	INDC2201	Industrial	Total Industrial	Delivered Energy	Regional
2501000000	Storage and Transport, Petroleum and Petroleum Product Storage, All Storage Types: Breathing Loss, Total: All Products	PETS3001	Energy Production		Refined Petroleum Products	National
2501000030	Storage and Transport, Petroleum and Petroleum Product Storage, All Storage Types: Breathing Loss, Crude Oil	PETS3001	Energy Production		Refined Petroleum Products	National
2501000180	Storage and Transport : Petroleum and Petroleum Product Storage : All Storage Types: Breathing Loss : Kerosene	TOTC2501	Total Energy		Kerosene	Regional
2501010000	Storage and Transport, Petroleum and Petroleum Product Storage, Commercial/Industrial: Breathing Loss, Total: All Products	PETS3001	Energy Production		Refined Petroleum Products	National
2501010030	Storage and Transport : Petroleum and Petroleum Product Storage : Commercial/Industrial: Breathing Loss : Crude Oil	PETS3001	Energy Production		Refined Petroleum Products	National
2501010060	Storage and Transport : Petroleum and Petroleum Product Storage : Commercial/Industrial: Breathing Loss : Residual Oil	COMC1110	Commercial		Residual	Regional
2501010180	Storage and Transport : Petroleum and Petroleum Product Storage : Commercial/Industrial: Breathing Loss : Kerosene	COMC1104	Commercial		Kerosene	Regional
2501050000	Storage and Transport, Petroleum and Petroleum Product Storage, Bulk Stations/Terminals: Breathing Loss, Total: All Products	PETS3001	Energy Production		Refined Petroleum Products	National
2501050030	Storage and Transport, Petroleum and Petroleum Product Storage, Bulk Stations/Terminals: Breathing Loss, Crude Oil	PETS3001	Energy Production		Refined Petroleum Products	National
2501050060	Storage and Transport, Petroleum and Petroleum Product Storage, Bulk Stations/Terminals: Breathing Loss, Residual Oil	TOTC2507	Total Energy		Residual Fuel	Regional
2501050090	Storage and Transport, Petroleum and Petroleum Product Storage, Bulk Stations/Terminals: Breathing Loss, Distillate Oil	TOTC2505	Total Energy		Other Petroleum	Regional

Appendix G
Crosswalk Between Source Classification Codes (SCCs) and AEO Energy Forecast Variables

			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
2501050120	Storage and Transport, Petroleum and Petroleum Product Storage, Bulk Stations/Terminals: Breathing Loss, Gasoline	TRAN4001	Transportation		Motor Gasoline	Regional
2501050150	Storage and Transport, Petroleum and Petroleum Product Storage, Bulk Stations/Terminals: Breathing Loss, Jet Naphtha	TOTC2505	Total Energy		Other Petroleum	Regional
2501050180	Storage and Transport, Petroleum and Petroleum Product Storage, Bulk Stations/Terminals: Breathing Loss, Kerosene	TOTC2501	Total Energy		Kerosene	Regional
2501060000	Storage and Transport, Petroleum and Petroleum Product Storage, Gasoline Service Stations, Total: All Gasoline/All Processes	TRAN4001	Transportation		Motor Gasoline	Regional
2501060050	Storage and Transport, Petroleum and Petroleum Product Storage, Gasoline Service Stations, Stage 1: Total	TRAN4001	Transportation		Motor Gasoline	Regional
2501060051	Storage and Transport, Petroleum and Petroleum Product Storage, Gasoline Service Stations, Stage 1: Submerged Filling	TRAN4001	Transportation		Motor Gasoline	Regional
2501060052	Storage and Transport, Petroleum and Petroleum Product Storage, Gasoline Service Stations, Stage 1: Splash Filling	TRAN4001	Transportation		Motor Gasoline	Regional
2501060053	Storage and Transport, Petroleum and Petroleum Product Storage, Gasoline Service Stations, Stage 1: Balanced Submerged Filling	TRAN4001	Transportation		Motor Gasoline	Regional
2501060100	Storage and Transport, Petroleum and Petroleum Product Storage, Gasoline Service Stations, Stage 2: Total	TRAN4001	Transportation		Motor Gasoline	Regional
2501060101	Storage and Transport, Petroleum and Petroleum Product Storage, Gasoline Service Stations, Stage 2: Displacement Loss/Uncontrolled	TRAN4001	Transportation		Motor Gasoline	Regional
2501060102	Storage and Transport, Petroleum and Petroleum Product Storage, Gasoline Service Stations, Stage 2: Displacement Loss/Controlled	TRAN4001	Transportation		Motor Gasoline	Regional
2501060103	Storage and Transport, Petroleum and Petroleum Product Storage, Gasoline Service Stations, Stage 2: Spillage	TRAN4001	Transportation		Motor Gasoline	Regional
2501060200	Storage and Transport, Petroleum and Petroleum Product Storage, Gasoline Service Stations, Underground Tank: Total	TRAN4001	Transportation		Motor Gasoline	Regional
2501060201	Storage and Transport, Petroleum and Petroleum Product Storage, Gasoline Service Stations, Underground Tank: Breathing and Emptying	TRAN4001	Transportation		Motor Gasoline	Regional
2501070000	Storage and Transport, Petroleum and Petroleum Product Storage, Diesel Service Stations, Total: All Products/All Processes	TOTC2505	Total Energy		Other Petroleum	Regional
2501070051	Storage and Transport, Petroleum and Petroleum Product Storage, Diesel Service Stations, Stage 1: Submerged Filling	TOTC2505	Total Energy		Other Petroleum	Regional
2501070052	Storage and Transport, Petroleum and Petroleum Product Storage, Diesel Service Stations, Stage 1: Splash Filling	TOTC2505	Total Energy		Other Petroleum	Regional
2501070053	Storage and Transport : Petroleum and Petroleum Product Storage : Diesel Service Stations : Stage 1: Balanced Submerged Filling	TOTC2505	Total Energy		Other Petroleum	Regional
2501070100	Storage and Transport : Petroleum and Petroleum Product Storage : Diesel Service Stations : Stage 2: Total	TOTC2505	Total Energy		Other Petroleum	Regional
2501070101	Storage and Transport, Petroleum and Petroleum Product Storage, Diesel Service Stations, Stage 2: Displacement Loss/Uncontrolled	TOTC2505	Total Energy		Other Petroleum	Regional
2501070103	Storage and Transport, Petroleum and Petroleum Product Storage, Diesel Service Stations, Stage 2: Spillage	TOTC2505	Total Energy		Other Petroleum	Regional
2501070201	Storage and Transport, Petroleum and Petroleum Product Storage, Diesel Service Stations, Underground Tank: Breathing and Emptying	TOTC2505	Total Energy		Other Petroleum	Regional
2501080050	Storage and Transport : Petroleum and Petroleum Product Storage : Airports : Aviation Gasoline : Stage 1: Total	TOTC2505	Total Energy		Other Petroleum	Regional
2501080100	Storage and Transport : Petroleum and Petroleum Product Storage : Airports : Aviation Gasoline : Stage 2: Total	TOTC2505	Total Energy		Other Petroleum	Regional
2501995000	Storage and Transport, Petroleum and Petroleum Product Storage, All Storage Types: Working Loss, Total: All Products	PETS3001	Energy Production		Refined Petroleum Products	National
2501995030	Storage and Transport, Petroleum and Petroleum Product Storage, All Storage Types: Working Loss, Crude Oil	PETS3001	Energy Production		Refined Petroleum Products	National
2501995060	Storage and Transport, Petroleum and Petroleum Product Storage, All Storage Types: Working Loss, Residual Oil	TOTC2507	Total Energy		Residual Fuel	Regional
2501995090	Storage and Transport, Petroleum and Petroleum Product Storage, All Storage Types: Working Loss, Distillate Oil	TOTC2505	Total Energy		Other Petroleum	Regional
2501995120	Storage and Transport, Petroleum and Petroleum Product Storage, All Storage Types: Working Loss, Gasoline	TRAN4001	Transportation		Motor Gasoline	Regional
2501995150	Storage and Transport, Petroleum and Petroleum Product Storage, All Storage Types: Working Loss, Jet Naphtha	TRAN4002	Transportation		Jet Fuel	Regional
2501995180	Storage and Transport, Petroleum and Petroleum Product Storage, All Storage Types: Working Loss, Kerosene	TOTC2501	Total Energy		Kerosene	Regional
2505000000	Storage and Transport, Petroleum and Petroleum Product Transport, All Transport Types, Total: All Products	PETS3001	Energy Production		Refined Petroleum Products	National

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			ANNUAL ENERGY OUTLOOK 2005 VARIABLE			
SCC	SCC DESCRIPTION	INDICATOR CODE(S)	SECTOR(S)	SUBSECTOR(S)	FUEL TYPE	GEOGRAPHIC RESOLUTION
2505010000	Storage and Transport : Petroleum and Petroleum Product Transport : Rail Tank Car : Total: All Products	PETS3001	Energy Production		Refined Petroleum Products	National
2505000120	Storage and Transport, Petroleum and Petroleum Product Transport, All Transport Types, Gasoline	TRAN4001	Transportation		Motor Gasoline	Regional
2505010000	Storage and Transport, Petroleum and Petroleum Product Transport, Rail Tank Car, Total: All Products	PETS3001	Energy Production		Refined Petroleum Products	National
2505010120	Storage and Transport, Petroleum and Petroleum Product Transport, Rail Tank Car, Gasoline	PETS3001	Energy Production		Refined Petroleum Products	National
2505020000	Storage and Transport, Petroleum and Petroleum Product Transport, Marine Vessel, Total: All Products	PETS3001	Energy Production		Refined Petroleum Products	National
2505020030	Storage and Transport, Petroleum and Petroleum Product Transport, Marine Vessel, Crude Oil	PETS3001	Energy Production		Refined Petroleum Products	National
2505020060	Storage and Transport, Petroleum and Petroleum Product Transport, Marine Vessel, Residual Oil	TOTC2507	Total Energy		Residual Fuel	Regional
2505020090	Storage and Transport, Petroleum and Petroleum Product Transport, Marine Vessel, Distillate Oil	TOTC2505	Total Energy		Other Petroleum	Regional
2505020120	Storage and Transport, Petroleum and Petroleum Product Transport, Marine Vessel, Gasoline	TRAN4001	Transportation		Motor Gasoline	Regional
2505020121	Storage and Transport : Petroleum and Petroleum Product Transport : Marine Vessel : Gasoline - Barge	TRAN4001	Transportation		Motor Gasoline	Regional
2505020150	Storage and Transport, Petroleum and Petroleum Product Transport, Marine Vessel, Jet Naphtha	TOTC2505	Total Energy		Other Petroleum	Regional
2505020180	Storage and Transport, Petroleum and Petroleum Product Transport, Marine Vessel, Kerosene	TOTC2501	Total Energy		Kerosene	Regional
2505020900	Storage and Transport, Petroleum and Petroleum Product Transport, Marine Vessel, Tank Cleaning	PETS3001	Energy Production		Refined Petroleum Products	National
2505030000	Storage and Transport, Petroleum and Petroleum Product Transport, Truck, Total: All Products	PETS3001	Energy Production		Refined Petroleum Products	National
2505030120	Storage and Transport, Petroleum and Petroleum Product Transport, Truck, Gasoline	TRAN4001	Transportation		Motor Gasoline	Regional
2505030180	Storage and Transport : Petroleum and Petroleum Product Transport : Truck : Kerosene	TOTC2501	Total Energy		Kerosene	Regional
2801520000	Miscellaneous Area Sources, Agriculture Production - Crops, Orchard Heaters, Total, all fuels	AGRC1004	Agriculture		Total Energy	National
2801520004	Miscellaneous Area Sources : Agriculture Production - Crops : Orchard Heaters : Diesel	AGRC1001	Agriculture		Distillate Oil	National
2801520010	Miscellaneous Area Sources : Agriculture Production - Crops : Orchard Heaters : Propane	AGRC1002	Agriculture		Liquified Petroleum Gas	National

SCC descriptions are blank if the reported SCC does not appear on EPA's official SCC list; these SCCs were assigned to AEO energy forecast variables based on the AEO assignments of closely related valid SCCs