Technical Report No. 5

Air Emissions Inventory for the Greater Metropolitan Region in New South Wales

2008 Calendar Year

Industrial Emissions: Results



ACKNOWLEDGMENTS

This study was performed with the help of organisations and individuals who should be recognised for their efforts.

Data provided by the 1,092 individual company premises that returned the industrial surveys were essential for the completion of this study.

The work of a number of individuals is acknowledged, including Mr Nick Agapides, Manager Major Air Projects and Mr Kelsey Bawden, Senior Technical Policy Advisor, for their efforts in project scoping or management, developing emission estimation methodologies, collecting activity data, developing databases, estimating emissions and/or preparing this report.

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EXECUTIVE SUMMARY

An air emissions inventory project for industrial sources has taken over 2 years to complete. The base year of the industrial inventory represents activities that took place during the 2008 calendar year and is accompanied by emission projections in yearly increments up to the 2036 calendar year. The area included in the inventory covers the greater Sydney, Newcastle and Wollongong regions, known collectively as the Greater Metropolitan Region (GMR).

The inventory region defined as the GMR measures 210 km (east-west) by 273 km (north-south). The inventory region is defined in Table ES-1 and shown in Figure ES-1.

· · · · · · · · · · · · · · · · · · ·										
Region	South-west corne	r MGA ¹ coordinates	North-east corner MGA ¹ coordinates							
Region	Easting (km)	Northing (km)	Easting (km)	Northing (km)						
Greater Metropolitan	210	6159	420	6432						
Sydney	261	6201	360	6300						
Newcastle	360	6348	408	6372						
Wollongong	279	6174	318	6201						

Table ES-1: Definition of Greater Metropolitan, Sydney, Newcastle and Wollongong regions

¹Map Grid of Australia based on the Geocentric Datum of Australia 1994 (GDA94) (ICSM, 2006).

The industrial emissions inventory includes emissions from 1,092 licensed facilities. A total of 9,775 emission sources have been included in the industrial emissions inventory, consisting of 1,750 point sources and 8,025 fugitive sources. Table ES-2 presents the number and type of emission sources included in the industrial emissions inventory for each area considered.

Area	Point sources	Fugitive sources	Total sources					
Sydney	1,184	4,014	5,198					
Newcastle	191	882	1,073					
Wollongong	159	362	521					
Non Urban	216	2,767	2,983					
GMR	1,750	8,025	9,775					

Table ES-2: Emission source summary

The pollutants inventoried include criteria pollutants specified in the Ambient Air Quality NEPM (NEPC, 2003), air toxics associated with the National Pollutant Inventory NEPM (NEPC, 2008) and the Air Toxics NEPM (NEPC, 2004), and any other pollutants associated with state-specific programs, i.e. Load Based Licensing (Protection of the Environment Operations (General) Regulation 2009 (PCO, 2010)) and the Protection of the Environment Operations (Clean Air) Regulation 2010 (PCO, 2011).

2008 Calendar Year Industrial Emissions: Results Executive Summary

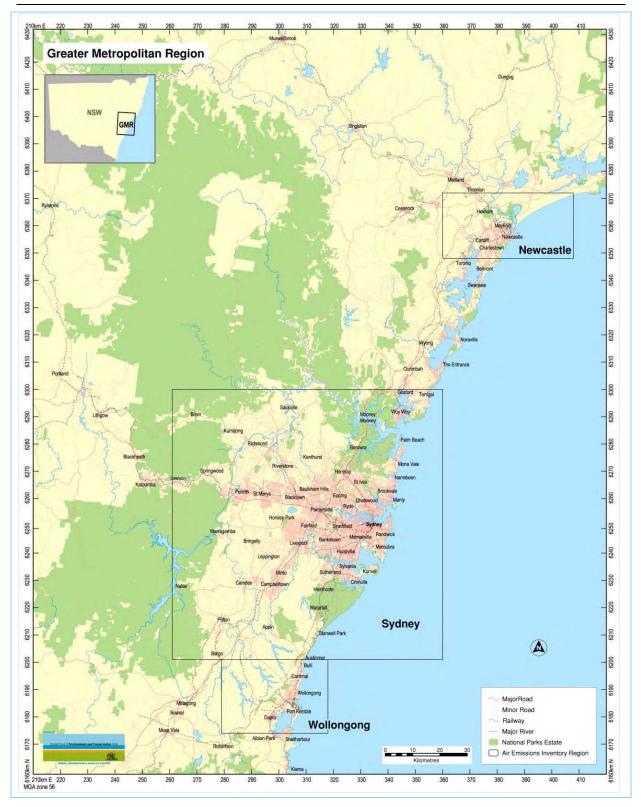


Figure ES-1: Definition of Greater Metropolitan, Sydney, Newcastle and Wollongong regions

The location of each emission source included in the industrial air emissions inventory is shown in Figure ES-2.

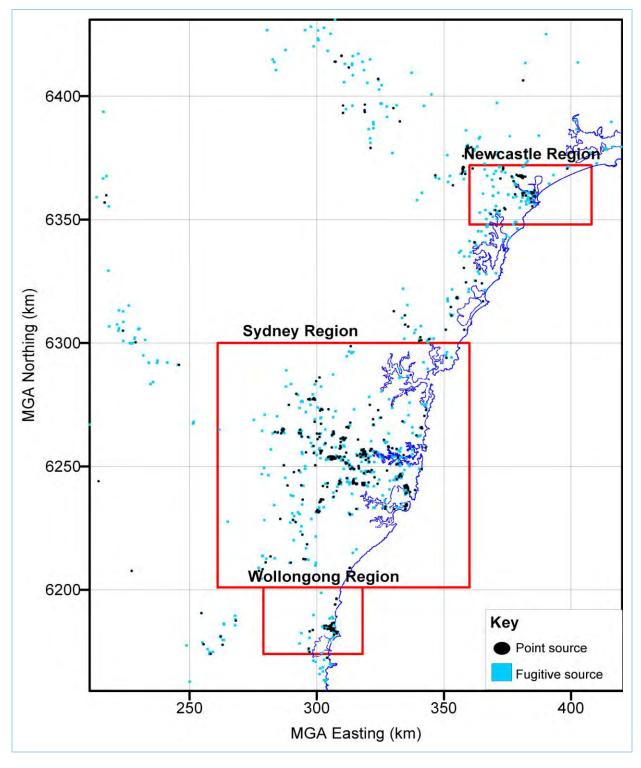


Figure ES-2: Industrial emission sources in the GMR

Table ES-3 shows the total estimated annual emissions (for selected substances) from all industrial sources in the GMR and in the Sydney, Newcastle, Wollongong and Non Urban regions.

Substance	Emissions (tonne/year)								
Substance	Sydney	Newcastle	Wollongong	Non Urban	GMR				
1,3 BUTADIENE	1.55	0.83	1.5	2.97	6.85				
ACETALDEHYDE	2.21	2.48	0.13	0.02	4.84				
BENZENE	157	43.7	253	7.3	460				
CARBON MONOXIDE	14,200	41,900	529,000	27,800	613,000				
FORMALDEHYDE	234	7.62	14.9	4.11	260				
ISOMERS OF XYLENE	152	33.1	8.97	519	713				
LEAD AND COMPOUNDS	6.47	4.05	3.99	27.3	41.8				
OXIDES OF NITROGEN	8,920	1,830	7,780	173,000	191,000				
PARTICULATE MATTER ≤ 10 µm	6,210	3,740	2,100	61,200	73,200				
PARTICULATE MATTER ≤ 2.5 µm	1,930	1,110	1,350	13,300	17,700				
POLYCYCLIC AROMATIC HYDROCARBONS	2.05	6.77	34.1	4.03	46.9				
SULFUR DIOXIDE	5,570	10,300	8,490	256,000	280,000				
TETRACHLOROETHYLENE	12.6	3.36	1.12	16.9	34				
TOLUENE	421	60.3	43.1	143	667				
TOTAL SUSPENDED PARTICULATE	17,500	9,820	5,480	161,000	193,000				
TOTAL VOLATILE ORGANIC COMPOUNDS	8,210	771	716	1,830	11,500				
TRICHLOROETHYLENE	19.9	2.54	2.02	22.5	47				

Table ES-3: Total estimated annual emissions from industrial sources in each region

Figure ES-3 shows the proportion of total estimated annual emissions (for selected substances) from all industrial sources in the GMR and in the Sydney, Newcastle, Wollongong and Non Urban regions.

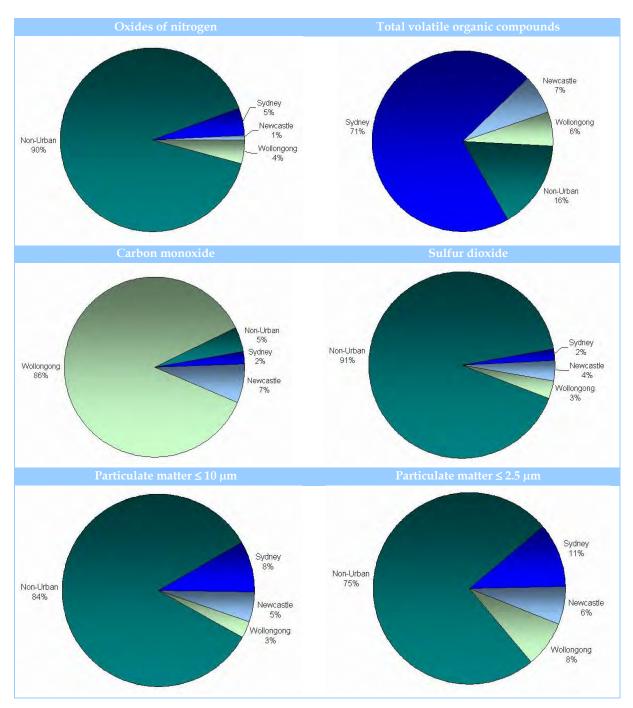


Figure ES-3: Proportion of total estimated annual emissions from industrial sources in each region

Table ES-4 shows total estimated annual emissions (for selected substances) from each industrial source type in the GMR.

	Emissions (tonne/year)						
Activity	CO	NO _x	TSP	PM ₁₀	PM _{2.5}	SO ₂	VOC
Agricultural fertiliser							
(phosphate) production	1.09	0.501	44.3	40	38.4	0.00262	0.0288
Aluminium production							
(alumina)	53,000	511	862	391	255	13,900	15.8
Aluminium production							
(scrap metal)	69.4	44.7	46.7	23.9	19.4	27.2	35
Ammonium nitrate							
production	258	844	337	323	316	0.923	132
Animal accommodation	0.00922	0.0428	21.9	10.5	1.35	0.00005	0.0287
Battery production	0	0	3.95	3.94	3.94	0	0
Bird accommodation	1.98	4.82	724	319	71.4	0.0257	0.265
Bitumen mixing	267	27.4	146	91.4	53.6	9.69	29.3
Boat							
construction/maintenance							
(dry/float)	0.0201	0.0402	84.3	57.3	48.9	0.00029	16.7
Boat							
construction/maintenance							
(general)	0	0.578	15.4	12.8	11.7	0	40.7
Boat mooring and storage	0	0	0.785	0.151	0.0365	0	3.06
Brewing and distilling	8.22	18.6	1.82	1.24	1.14	0.0513	18.8
Cement or lime handling	97.6	23.6	122	58.1	13.8	2.52	213
Cement or lime							
production	1,670	5,020	1,240	679	582	379	6.84
Ceramics production	935	296	1,800	855	593	581	32.5
Chemical production	89.6	221	81.2	29.3	11.2	65.5	452
Chemical storage	0.128	0.152	0.0414	0.0176	0.0129	0.00079	0.0234
Coal washery reject or slag							
landfilling	0	0	33.7	16.6	3.29	0	0
Coal works	0.00031	0.00145	2,970	1,000	126	0	0.403
Coke production	6.55	24.7	163	71.6	59.5	455	0.578
Composting	24.6	39.3	466	176	31.7	0.0458	1120
Concrete works	7.73	9.33	396	129	22	0.0494	8.64
Container reconditioning	1.72	2.22	4.11	1.23	0.283	0.0117	73.1
Contaminated soil							
treatment	17.7	40.2	44.5	16.4	3.72	0.111	1.23
Crushing, grinding or							
separating	222	37.9	1560	405	86.6	5.88	9.03
Dairy animal	-		*				
accommodation	0	0	48.8	23.4	3	0	0.0246
Dairy processing	10.9	12	181	35.6	9.35	0.068	3.83
Explosives production	0.173	0.177	0.834	0.199	0.0315	0.00017	0.161
General agricultural							
processing	41.1	49	190	101	46.3	0.324	6.14

Table ES-4: Total estimated annual emissions by industry source type in the GMR

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Activity			Emissi	ons (tonne/y	year)		
	СО	NO _x	TSP	PM ₁₀	PM _{2.5}	SO ₂	VOC
production							
General chemicals storage	3.14	3.86	66.3	13	3.35	31.2	8.83
Generation of electrical							
power from coal	7,530	166,000	8,280	6,520	3,340	251,000	904
Generation of electrical							
power from gas	2,220	2,360	84.9	84.9	84.9	17.8	411
Generation of electricity							
not coal or gas	283	130	2.17	2.04	2.01	10.9	34.5
Glass production							
(container)	35.2	1090	125	118	114	327	35.2
Glass production (float)	41	225	40.8	31.6	27.7	223	5.37
Hazardous, industrial or							
group A waste disposal	0	0	74.2	21.1	2.11	0	0
Hazardous, industrial or							
group A waste generation	0	0	0.0084	0.00161	0.00039	0	0
Helicopter-related activity	0	0	0	0	0	0	0.00324
Inert waste landfilling	1.61	0	71.8	35.5	7.07	0	18.3
Iron or steel production							
(iron ore)	528,000	7,510	4,590	1,750	1,220	8,220	452
Iron or steel production							
(scrap metal)	9,090	168	251	149	128	10.5	385
Land-based extractive							
activity	16.7	52.5	10,300	2,800	569	0.227	6.55
Metal plating or coating	1,080	93.1	100	52.2	40.8	24.3	467
Metal processing	130	85.2	90.1	35.9	23	1.91	91.7
Mining for coal	4,570	2,460	145,000	52,500	8,830	496	199
Mining for minerals	0	0	1,330	441	79	0	0.0591
Miscellaneous licensed			,				
discharges to waters (at							
any time)	0	0	28.9	8.11	0.848	0	0.023
Non-ferrous metal							
production (scrap)	281	16.2	7.83	4	3.37	130	2.16
Non-thermal treatment of							
waste	9.35	22.2	252	92.9	23.4	2.29	25.3
Other land-based							
extraction	5.28	0.531	4,670	1,360	152	0.00386	2.71
Paints/polishes/adhesives			,	,	-		-
production	8.17	2.55	12.6	10.3	7.63	0.103	99.9
Paper or pulp production	59.4	135	7.84	5.86	5.51	0.371	6.14
Paper production using							
recycle materials	5.36	12.2	2.2	1.31	1.31	0.0334	0.44
Pesticides and related	5.00			1	1		
products production	0.245	0.387	2.34	1.94	1.67	0.00143	10.5
Petrochemical production	257	1,100	40.5	24	1.07	229	699
Petroleum products and	207	1,100	10.0	12	17.5		077
fuel production	1,380	1,900	349	180	99.1	3120	1420
Petroleum products	1,000	1,700	017	100	· · · · ·	0120	1 120
storage	1,460	533	56.3	45.3	43.5	737	864
Pharmaceutical and	1,400	14.8	1.64	1.05	0.945	0.0648	26.5
i narmaceuncal anu	10	14.0	1.04	1.05	0.943	0.0040	20.3

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Antinita	Emissions (tonne/year)							
Activity	CO	NO _x	TSP	PM_{10}	PM _{2.5}	SO ₂	VOC	
veterinary products								
production								
Pig accommodation	0	0	0.088	0.0169	0.00409	0	0.0445	
Plastics resins production	25.7	7.23	2.42	0.801	0.509	0.0142	128	
Printing, packaging and								
visual media production	4.79	6.13	0.88	0.543	0.482	0.0297	1830	
Railway systems activities	0	0	282	79.6	9.14	0	0.298	
Recovery of waste	0.614	0.731	305	95.1	15.1	0.00382	5.78	
Recovery of waste oil	7.73	15	2.19	1.08	0.874	6.17	1.32	
Recovery of waste tyres	0	0	0.0134	0.00257	0.00062	0	0.261	
Rendering or fat extraction	21.6	46.1	9.66	3.78	2.32	0.139	2.04	
Road construction	0.203	0.943	108	25.5	3.66	0.0011	0.0689	
Rubber products/tyre								
production	0.00851	0.02	0.0741	0.0496	0.0452	0.00011	3.65	
Scrap metal processing	0	7.93	84.8	52.8	39.3	0	0.00829	
Sewage treatment – large								
plants	53.8	116	11.1	4.25	2.96	0.149	70.1	
Sewage treatment – small								
plants	1.88	1.98	79	21.2	2.99	0.0126	33.1	
Shipping in bulk	0.014	0.0653	96.5	44.9	14.9	0.00008	22.5	
Slaughtering or processing								
of animals	8.55	48.2	206	68.2	17.1	65.5	6.98	
Soap and detergent								
production	4.49	4.34	0.781	0.48	0.426	0.791	69.2	
Solid waste landfilling	8.38	0	138	60.4	11.6	0	118	
Sterilisation activities	1.05	1.23	0.0983	0.0962	0.0958	0.00658	0.0692	
Waste disposal								
(application to land)	43.2	0	4610	1,590	297	0	831	
Waste storage	0.161	0.245	63.7	19.6	3.6	0.00099	0.787	
Water-based extractive								
activity	0	0	24.2	10.3	1.84	0	0.398	
Wood or timber milling or								
processing	30.8	1.6	13.8	7.81	2.92	0.0075	0.165	
Grand total	613,000	191,000	193,000	73,200	17,700	280,000	11,500	

 $PM_{2.5}$, particulate matter $\leq 2.5 \ \mu$ m; PM_{10} , particulate matter $\leq 10 \ \mu$ m; TSP, total suspended particulate; VOC, volatile organic compounds

Figure ES-4 shows the proportion of total estimated annual emissions (for selected substances) from each industrial source type in the GMR.

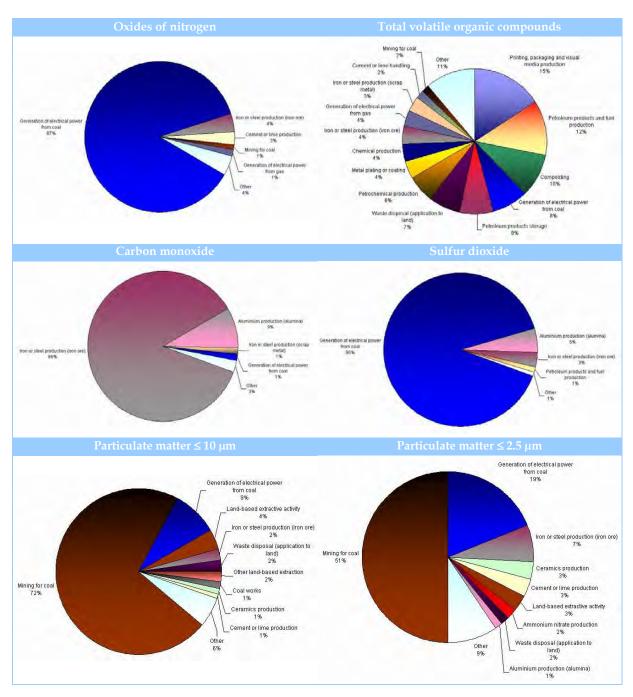


Figure ES-4: Proportion of total emissions by industry source type in the GMR

Table ES-5 shows total estimated annual emissions (for selected substances) from each industrial source type in the Sydney region.

	Emissions (tonne/year)								
Activity	СО	NO _x	TSP	PM ₁₀	PM _{2.5}	SO ₂	VOC		
Aluminium production									
(scrap metal)	46.9	33.8	24.9	9.56	9.18	22.2	34		
Battery production	0	0	3.95	3.94	3.94	0	0		
Bird accommodation	1.4	3.67	536	238	53.9	0.0174	0.195		
Bitumen mixing	204	15.6	105	59.3	29	3.01	20.2		
Boat									
construction/maintenance									
(dry/float)	0	0	0.165	0.0317	0.00766	0	4.54		
Boat									
construction/maintenance									
(general)	0	0	14.8	12.6	11.5	0	30.8		
Boat mooring and storage	0	0	0.396	0.076	0.0184	0	2.6		
Brewing and distilling	8.22	18.6	1.82	1.24	1.14	0.0513	18.8		
Cement or lime handling	97.2	23.1	100	49	12.3	2.52	213		
Cement or lime									
production	47.2	808	51.9	40.8	37.7	8.19	1.28		
Ceramics production	767	227	1,410	681	478	505	29.5		
Chemical production	49.4	69.5	39.2	12.5	4.39	0.92	370		
Chemical storage	0.128	0.152	0.0414	0.0176	0.0129	0.00079	0.0234		
Coke production	3.45	12.8	109	43.1	31.9	237	0.227		
Composting	24.6	39.3	420	156	28.2	0.0458	900		
Concrete works	4.62	5.64	310	100	17	0.0301	4.94		
Container reconditioning	1.72	2.21	4.01	1.21	0.278	0.0115	69.5		
Contaminated soil									
treatment	17.7	40.2	23.6	8.55	2.43	0.111	1.2		
Crushing, grinding or									
separating	221	37.4	1,450	372	80.6	5.88	8.33		
Dairy animal			,						
accommodation	0	0	48.8	23.4	3	0	0.0246		
Dairy processing	8.1	8.61	179	34.9	9.01	0.0504	3.01		
General agricultural									
processing	23.3	27.9	161	85.8	40.8	0.213	2.94		
General animal products			-						
production	27.2	50.8	2.8	2.53	2.48	0.169	2.96		
General chemicals storage	0	0	65.3	12.5	3.03	0	8.59		
Generation of electrical	Ť	-							
power from gas	1,640	2,080	49.3	49.3	49.3	14.8	352		
Generation of electricity	1,010	_,	17.5	17.0	17.0				
not coal or gas	282	129	2.12	1.99	1.96	10.9	34.4		
Glass production				1	1.75	1017	0.11		
(container)	35.2	1,090	125	118	114	327	35.2		
Glass production (float)	41	225	40.8	31.6	27.7	223	5.37		
Hazardous, industrial or			10.0	01.0	_,.,		0.07		
group A waste D	0	0	74.2	21.1	2.11	0	0		
Eroup 11 Wasie D	U	U	/4.2	∠1.1	2.11	0	0		

Table ES-5: Total estimated annual emissions by industry source type in the Sydney region

Air Emissions Inventory for the Greater Metropolitan Region of New South Wales Executive Summary

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group A waste G0.00.00.000560.000140.00.000231Helicopter-related activity000.000.00.000231Icon or sete production6.88026.11.629.057.551.63350Land-based extractive00.02.822.946.120.0433Attal plating or coating20.7727.57.712.882.710.0141.111Metal plating or coating20.7727.57.712.892.710.01431.111Metal plating or coating20.7727.57.712.894.012.530.000893.55Miscellancous licensed0.006850.1611.1004.105.200.000943.551.551.620.000941.551.551.620.000940.00394Non-formal treatment of0002.898.110.480.000012.67Other land-based5.520.01124.601.3001.450.000012.67Paints/polishes/athesivesproduction5.941.0157.685.510.0310.614Paper or pulp production5.941.1221.1311.3130.00340.414Paint-polishes/athesivesproduction usingPaper or pulp production0.2450.3871.841.63 </th <th>Activity</th> <th>СО</th> <th>NO_x</th> <th>TSP</th> <th>PM_{10}</th> <th>PM_{2.5}</th> <th>SO₂</th> <th>VOC</th>	Activity	СО	NO _x	TSP	PM_{10}	PM _{2.5}	SO ₂	VOC
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Land-based extractive activity 0 0 982 294 61.2 0 0.453 Metal plating or coating 20.7 27.5 37.1 5.97 4.94 0.91 25.4 Mining for coal 0.0685 0.161 1.100 410 52 0.0089 3.95 Miscellaneous licensed 0 0 28.9 8.11 0.848 0 0.00394 Non-ferrous metal production (scrap) 0 0 28.9 8.11 0.848 0 0.00394 Non-thermal treatment of waste 8.52 2.1 242 89.1 22.5 1.29 20.7 Other land-based	-							
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any time)0.00.028.98.110.8480.00.00394Non-ferrous metal <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
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Other land-based 5.02 0.00192 4460 1300 145 0.00001 2.67 Paints/polishes/adhesives 2.55 12.6 10.3 7.63 0.103 99.9 Paper or pulp production 594 135 7.84 5.51 0.371 6.14 Paper or pulp production using $ -$	Non-thermal treatment of							
extaction 5.02 0.00192 4460 1300 145 0.0001 2.67 Paints/polishes/adhesives production 8.17 2.55 12.6 10.3 7.63 0.103 99.9 Paper or pulp production 59.4 135 7.84 5.86 5.51 0.0371 6.14 Paper production using recycle materials 5.36 12.2 2.2 1.31 1.31 0.034 0.44 Petricides and related products production 0.245 0.387 1.86 1.84 1.63 0.00143 10.5 Petrochemical production 257 1.100 40.5 244 17.5 229 699 Petroleum products and fuel production 1.380 1.890 347 179 98.4 3.101 1.420 Petroleum products arrage 1.460 533 56.2 45.3 43.5 737 630 Pharmaceutical and veterinary products 		8.52	21	242	89.1	22.5	1.29	20.7
Paints/polishes/adhesives production 8.17 2.55 12.6 10.3 7.63 0.103 99.9 Paper or pulp production 59.4 135 7.84 5.86 5.51 0.371 6.14 Paper or pulp production using recycle materials 5.36 12.2 2.2 1.31 1.31 0.0334 0.44 Pesticides and related products production 0.245 0.387 1.86 1.84 1.63 0.00143 10.5 Petrochemical production 0.245 0.387 1.86 1.84 1.63 0.00143 10.5 Petroleum products and fuel products 1 1.890 347 179 98.4 3,110 1,420 Petroleum products 1 1.60 533 56.2 45.3 43.5 737 630 Pharmaceutical and veterinary products 1 1.46 1.64 1.05 0.945 0.0648 26.5 Pig accommodation 0 0 0.88 0.0169 0.0142 128 Printing, packaging	Other land-based							
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Paper or pulp production 59.4 135 7.84 5.86 5.51 0.371 6.14 Paper production using recycle materials 5.36 12.2 2.2 1.31 1.31 0.0334 0.44 Pesticides and related production 0.245 0.387 1.86 1.84 1.63 0.00143 10.5 Petrochemical production 257 $1,100$ 40.5 24 17.5 229 699 Petroleum products and fuel production 1.380 1.890 347 179 98.4 $3,110$ $1,420$ Petroleum products 1.460 533 56.2 45.3 43.5 737 630 Pharmaceutical and veterinary products 100 14.8 1.64 1.05 0.945 0.0648 26.5 Pig accommodation 01 14.8 1.64 1.05 0.945 0.0648 26.5 Pig accommodation 25.7 7.23 2.42 0.801 0.00409 0 0.226 Pinting, packaging and visual media production 4.79 6.13 0.87 0.541 0.481 0.0297 1.740 Railway systems activities 0 0 283 87.7 13.6 0 0.284 Recovery of waste oil 5.66 6.76 1.96 0.86 0.662 0.0536 0.984 Recovery of waste tories 0 0 0.0134 0.00257 0.00062 0 0.261 Recovery of waste tories 0 <	-							
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recycle materials5.3612.22.21.311.310.03340.44Pesticides and related0.2450.3871.861.841.630.0014310.5Petrochemical production0.2450.3871.861.841.630.0014310.5Petrochemical products and fuel products and1.3801.89034717998.43,1101,420Petroleum products1,46053356.245.343.5737630Pharmaceutical and veterinary products114.653356.245.343.5737630Pig accommodation1014.81.641.050.9450.064826.5Pig accommodation000.0880.01690.0040900.0266Plastics resins production25.77.232.420.8010.5090.0142128Printing packaging and visual media production4.796.130.870.5410.4810.02971,740Recovery of waste0028387.713.600.6610.984Recovery of waste oil5.666.761.960.8660.6620.05360.984Recovery of waste oil0.6260.0338.7713.600.268Recovery of waste oil5.661.960.860.6620.05360.984Recovery of waste oil0.6030.02438.7713.600.268Recovery of waste oi		59.4	135	7.84	5.86	5.51	0.371	6.14
Pesticides and related products production 0.245 0.387 1.86 1.84 1.63 0.00143 10.5 Petrochemical production 257 $1,100$ 40.5 24 17.5 229 699 Petroleum products and fuel production $1,380$ $1,890$ 347 179 98.4 $3,110$ $1,420$ Petroleum products $1,460$ 533 56.2 45.3 43.5 737 630 Pharmaceutical and veterinary products $1,460$ 533 56.2 45.3 43.5 737 630 Pharmaceutical and veterinary products 10 14.8 1.64 1.05 0.945 0.0648 26.5 Pig accommodation 10 14.8 1.64 1.05 0.945 0.0648 26.5 Pig accommodation 00 0.088 0.0169 0.00409 0 0.0226 Plastics resins production 25.7 7.23 2.42 0.801 0.509 0.0142 128 Printing, packaging and visual media production 4.79 6.13 0.87 0.541 0.481 0.0297 1.740 Recovery of waste 0 0 283 87.7 13.6 0 0.671 Recovery of waste oil 5.66 6.76 1.96 0.86 0.662 0.0536 0.984 Recovery of waste oil 5.66 6.76 1.96 0.86 0.662 0.0536 0.984 Recovery of waste tyres 0 0.013	Paper production using							
products production0.2450.3871.861.841.630.0014310.5Petrochemical production2571,10040.52417.52296699Petroleum products and fuel production1,3801,890347177998.43,1101,420Petroleum products	recycle materials	5.36	12.2	2.2	1.31	1.31	0.0334	0.44
Petrochemical production 257 1,100 40.5 24 17.5 229 699 Petroleum products and fuel production 1,380 1,890 347 179 98.4 3,110 1,420 Petroleum products 1,460 533 56.2 45.3 43.5 737 630 Pharmaceutical and veterinary products 1 14.8 1.64 1.05 0.945 0.0648 26.5 Pig accommodation 0 0 0.088 0.0169 0.00409 0 0.0266 Plastics resins production 25.7 7.23 2.42 0.801 0.509 0.0142 128 Printing, packaging and visual media production 4.79 6.13 0.87 0.541 0.481 0.0297 1,740 Recovery of waste 0 0 283 87.7 13.6 0 0.671 Recovery of waste oil 5.66 6.76 1.96 0.86 0.662 0.0536 0.984 Recovery of waste oil 5.66 <t< td=""><td>Pesticides and related</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Pesticides and related							
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fuel production1,3801,89034717998.43,1101,420Petroleum products1,46053356.245.343.5737630Storage1,46053356.245.343.5737630Pharmaceutical and630veterinary products630production630Pig accommodation	Petrochemical production	257	1,100	40.5	24	17.5	229	699
Petroleum products storage1,46053356.245.343.5737630Pharmaceutical and veterinary products $$	Petroleum products and							
storage1,46053356.245.343.5737630Pharmaceutical and veterinary productsIIIIIIIIproduction11014.81.641.050.0450.064826.5Pig accommodation000.0880.01690.004090.0266Plastics resins production25.77.232.420.8010.0590.0142128Printing, packaging and visual media production4.796.130.870.5410.4810.02971,740Railway systems activities0028279.69.140.02980.613Recovery of waste0028387.713.600.671Rendering or fat extraction17.6398.973.331.910.1141.68Road construction0.008510.09470.219.72.390.00113.655Scrap metal processing04.8183.852.639.30.00.00475	fuel production	1,380	1,890	347	179	98.4	3,110	1,420
Pharmaceutical and veterinary products Image: block index inde	Petroleum products							
veterinary products productionImage: field set of the set o	storage	1,460	533	56.2	45.3	43.5	737	630
production 10 14.8 1.64 1.05 0.945 0.0648 26.5 Pig accommodation 0 0 0.088 0.0169 0.00409 0 0.0266 Plastics resins production 25.7 7.23 2.42 0.801 0.509 0.0142 128 Printing, packaging and 1.740 visual media production 4.79 6.13 0.87 0.541 0.481 0.0297 1,740 Railway systems activities 0 0 282 79.6 9.14 0 0.298 Recovery of waste 0 0 283 87.7 13.6 0.00 0.671 Recovery of waste oil 5.66 6.76 1.96 0.866 0.662 0.0536 0.984 Recovery of waste tyres 0 0 0.0134 0.00257 0.00062 0.0011 0.668 Read construction 0.203 0.943 7.02 19.7 2.39 0.0011 <td>Pharmaceutical and</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Pharmaceutical and							
Pig accommodation000.0880.01690.0040900.0266Plastics resins production25.77.232.420.8010.5090.0142128Printing, packaging and visual media production4.796.130.870.5410.4810.02971,740Railway systems activities0028279.69.1400.298Recovery of waste0028387.713.600.671Recovery of waste oil5.666.761.960.8660.6620.05360.984Recovery of waste tyres000.01340.002570.0006200.261Rendering or fat extraction17.6398.973.331.910.1141.68Road construction0.008510.020.07410.04960.04520.000113.65Scrap metal processing04.8183.852.639.300.00475	veterinary products							
Plastics resins production 25.7 7.23 2.42 0.801 0.509 0.0142 128 Printing, packaging and visual media production 4.79 6.13 0.87 0.541 0.481 0.0297 1,740 Railway systems activities 0 0 282 79.6 9.14 0 0.298 Recovery of waste 0 0 283 87.7 13.6 0 0.671 Recovery of waste oil 5.66 6.76 1.96 0.866 0.662 0.0536 0.984 Recovery of waste tyres 0 0 0.0134 0.00257 0.00062 0 0.261 Rendering or fat extraction 17.6 39 8.97 3.33 1.91 0.114 1.68 Road construction 0.203 0.943 70.2 19.7 2.39 0.0011 0.0689 Rubber products/tyre 0 0.0741 0.0496 0.0452 0.00011 3.65 Scrap metal processing 0 4.81 83.8	production	10	14.8	1.64	1.05	0.945	0.0648	26.5
Printing, packaging and visual media production 4.79 6.13 0.87 0.541 0.481 0.0297 1,740 Railway systems activities 0 0 282 79.6 9.14 0 0.298 Recovery of waste 0 0 283 87.7 13.6 0 0.671 Recovery of waste oil 5.66 6.76 1.96 0.866 0.662 0.0536 0.984 Recovery of waste tyres 0 0 0.0134 0.00257 0.00062 0 0.261 Rendering or fat extraction 17.6 39 8.97 3.33 1.91 0.114 1.68 Road construction 0.203 0.943 70.2 19.7 2.39 0.0011 0.0689 Rubber products/tyre	Pig accommodation	0	0	0.088	0.0169	0.00409	0	0.0266
visual media production4.796.130.870.5410.4810.02971,740Railway systems activities0028279.69.1400.298Recovery of waste0028387.713.600.671Recovery of waste oil5.666.761.960.860.6620.05360.984Recovery of waste tyres000.01340.002570.0006200.261Rendering or fat extraction17.6398.973.331.910.1141.68Road construction0.2030.94370.219.72.390.00110.0689Rubber products/tyre0.07410.04960.04520.000113.65Scrap metal processing04.8183.852.639.300.00475Sewage treatment - large </td <td>Plastics resins production</td> <td>25.7</td> <td>7.23</td> <td>2.42</td> <td>0.801</td> <td>0.509</td> <td>0.0142</td> <td>128</td>	Plastics resins production	25.7	7.23	2.42	0.801	0.509	0.0142	128
Railway systems activities 0 0 282 79.6 9.14 0 0.298 Recovery of waste 0 0 283 87.7 13.6 0 0.671 Recovery of waste oil 5.66 6.76 1.96 0.866 0.662 0.0536 0.984 Recovery of waste tyres 0 0 0.0134 0.00257 0.00062 0 0.261 Rendering or fat extraction 17.6 39 8.97 3.33 1.91 0.114 1.68 Road construction 0.203 0.943 70.2 19.7 2.39 0.0011 0.0689 Rubber products/tyre 3.65 Scrap metal processing 0.0 4.81 83.8 52.6 39.3 0.0 0.00475 Sewage treatment - large	Printing, packaging and							
Recovery of waste 0 0 283 87.7 13.6 0 0.671 Recovery of waste oil 5.66 6.76 1.96 0.86 0.662 0.0536 0.984 Recovery of waste tyres 0 0 0.0134 0.00257 0.00062 0 0.261 Rendering or fat extraction 17.6 39 8.97 3.33 1.91 0.114 1.68 Road construction 0.203 0.943 70.2 19.7 2.39 0.0011 0.0689 Rubber products/tyre -	visual media production	4.79	6.13	0.87	0.541	0.481	0.0297	1,740
Recovery of waste oil 5.66 6.76 1.96 0.86 0.662 0.0536 0.984 Recovery of waste tyres 0 0 0.0134 0.00257 0.00062 0 0.261 Rendering or fat extraction 17.6 39 8.97 3.33 1.91 0.114 1.68 Road construction 0.203 0.943 70.2 19.7 2.39 0.0011 0.0689 Rubber products/tyre	Railway systems activities	0	0	282	79.6	9.14	0	0.298
Recovery of waste tyres 0 0 0.0134 0.00257 0.00062 0 0.261 Rendering or fat extraction 17.6 39 8.97 3.33 1.91 0.114 1.68 Road construction 0.203 0.943 70.2 19.7 2.39 0.0011 0.0689 Rubber products/tyre -	Recovery of waste	0	0	283	87.7	13.6	0	0.671
Recovery of waste tyres 0 0 0.0134 0.00257 0.00062 0 0.261 Rendering or fat extraction 17.6 39 8.97 3.33 1.91 0.114 1.68 Road construction 0.203 0.943 70.2 19.7 2.39 0.0011 0.0689 Rubber products/tyre -	Recovery of waste oil	5.66	6.76	1.96	0.86	0.662	0.0536	0.984
Rendering or fat extraction 17.6 39 8.97 3.33 1.91 0.114 1.68 Road construction 0.203 0.943 70.2 19.7 2.39 0.0011 0.0689 Rubber products/tyre	-	0	0	0.0134	0.00257	0.00062	0	0.261
Road construction 0.203 0.943 70.2 19.7 2.39 0.0011 0.0689 Rubber products/tyre		17.6	39				0.114	
Rubber products/tyre 0.00851 0.02 0.0741 0.0496 0.0452 0.00011 3.65 Scrap metal processing 0 4.81 83.8 52.6 39.3 0 0.00475 Sewage treatment - large	_	0.203	0.943	70.2	19.7	2.39	0.0011	0.0689
production 0.00851 0.02 0.0741 0.0496 0.0452 0.00011 3.65 Scrap metal processing 0 4.81 83.8 52.6 39.3 0 0.00475 Sewage treatment - large	Rubber products/tyre							
Scrap metal processing04.8183.852.639.300.00475Sewage treatment - large<		0.00851	0.02	0.0741	0.0496	0.0452	0.00011	3.65
Sewage treatment - large	•							
	plants	52.5	115	7.54	3.25	2.46	0.141	37.2

2008 Calendar Year Industrial Emissions: Results Executive Summary

Astinita	Emissions (tonne/year)							
Activity	CO	NO _x	TSP	PM_{10}	PM _{2.5}	SO_2	VOC	
Sewage treatment - small								
plants	0.688	0.694	55.4	15.8	1.74	0.0043	3.27	
Shipping in bulk	0.014	0.0653	5.17	2.43	0.246	0.00008	0.00488	
Slaughtering or processing								
of animals	4.96	6.3	96.1	19.5	4.78	0.0311	5.38	
Soap and detergent								
production	4.49	4.34	0.781	0.48	0.426	0.791	69.2	
Solid waste landfilling	6.47	0	38.1	18.4	3.59	0	73.4	
Sterilisation activities	1.05	1.23	0.0983	0.0962	0.0958	0.00658	0.0692	
Waste disposal								
(application to land)	29.1	0	3,610	1,220	226	0	578	
Waste storage	0.161	0.245	51.5	16.1	3.25	0.00099	0.784	
Water-based extractive								
activity	0	0	0.322	0.0918	0.00918	0	0.288	
Grand total	14,200	8,920	17,500	6,210	1,930	5,570	8,210	

 $PM_{2.5}$, particulate matter $\leq 2.5 \ \mu$ m; PM_{10} , particulate matter $\leq 10 \ \mu$ m; TSP, total suspended particulate; VOC, volatile organic compounds

Figure ES-5 show the proportion of total estimated annual emissions (for selected substances) from each industrial source type in the Sydney region.

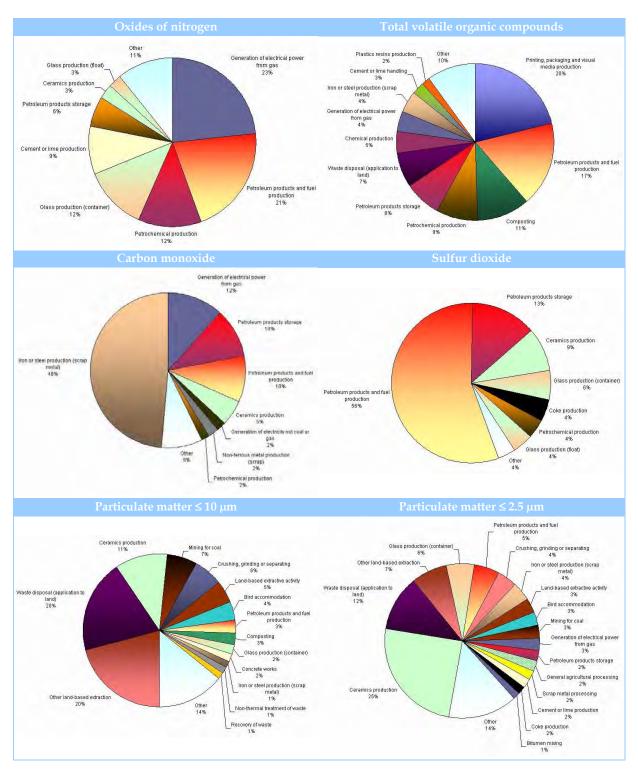


Figure ES-5: Proportion of total emissions by industry source type in the Sydney region