

APPENDIX E. UNIT EMISSIONS FIGURES FOR HGVS

Appendix C shows the detailed atmospheric emission estimates provided by AEA/Technology. These emission factors are discussed in Section 5.1 of the main report. All the emission factors are shown in grams per km.

The main tables show current emissions factors, while supplementary tables show emission reduction scaling factors for different technical options and future regulations.

Table E.1 show NO_x .

Table E.2 show PM_{10} .

Table E.3 shows carbon monoxide

Table E.4 shows NMVOCs.

Table E.5 shows benzene.

Table E.6 shows butadiene.

Table E.7 shows carbon dioxide.

Table E.8 shows sulphur dioxide.

Table E.9 shows PM_{10s} from tyre and brake wear.

Table E.1: NOx Emission Factors for HGVs (in g/km)

Type	Weight (tonnes)	Configuration	Pre-Euro 1											Euro I											Euro II																													
			Speed band											Speed band											Speed band																													
			10	1	2	3	4	5	6	7	8	55	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8																		
Rigids	3.5	7.5	2-axle	6.44	5.37	4.14	3.49	3.16	3.06	3.46	3.46	4.42	4.51	3.76	2.90	2.44	2.22	2.14	2.42	3.98	3.22	2.69	2.07	1.75	1.58	1.53	1.91	2.87	10.36	8.67	6.68	5.55	4.85	4.28	4.24	4.98	7.25	6.07	4.68	3.89	3.39	3.00	2.96	4.48	5.18	4.33	3.34	2.78	2.42	2.14	2.33	3.24		
	12	13	2-axle	12.43	10.52	8.21	6.84	5.94	5.13	4.85	5.49	8.70	7.36	5.75	4.79	4.16	3.59	3.39	3.99	4.94	6.22	5.26	4.11	3.42	2.97	2.56	2.67	3.57	13.12	11.14	8.75	7.30	6.33	5.44	5.09	5.70	9.18	7.80	6.12	5.11	4.43	3.81	3.56	5.13	6.56	5.57	4.37	3.65	3.17	2.72	2.80	3.70		
	14	15	2-axle	13.78	11.75	9.27	7.76	6.73	5.76	5.33	5.92	9.64	8.23	6.49	5.43	4.71	4.03	3.73	4.03	5.32	6.89	5.88	4.64	3.88	3.36	2.88	2.93	3.85	15.01	12.91	10.30	8.66	7.52	6.41	5.86	6.38	8.25	7.10	5.66	4.76	4.13	3.53	3.51	5.31	6.00	5.17	4.12	3.46	3.01	2.56	2.64	2.87		
	17	18	2-axle	15.59	13.47	10.80	9.10	7.91	6.74	6.13	6.62	8.58	7.41	5.94	5.01	4.35	3.71	3.68	3.64	6.24	8.01	7.08	5.84	5.01	4.40	3.78	3.81	3.89	17.14	14.96	12.15	10.31	8.99	7.67	6.91	7.32	9.43	8.23	6.68	5.67	4.95	4.22	4.15	4.02	6.85	5.99	4.86	4.12	3.60	3.07	3.11	3.29		
	21	23	3-axle	18.34	16.12	13.20	11.26	9.85	8.42	7.56	7.88	10.09	8.87	7.26	6.19	5.42	4.63	4.54	4.34	7.34	6.45	5.28	4.50	3.94	3.37	3.40	3.55	3.78	3.78	19.45	17.17	14.13	12.10	10.62	9.11	8.17	8.40	10.70	9.44	7.77	6.66	5.84	5.01	4.90	4.62	7.78	6.87	5.65	4.84	4.25	3.65	3.68		
	25	26	3-axle	20.02	17.70	14.60	12.52	11.01	9.46	8.48	8.65	11.01	9.73	8.03	6.89	6.06	5.20	5.09	4.76	8.01	7.08	5.84	5.01	4.40	3.78	3.81	3.89	23.10	20.40	16.85	14.52	12.87	11.18	9.99	9.80	12.70	11.22	9.27	7.99	7.08	6.15	5.99	5.39	9.24	8.16	6.74	5.81	5.15	4.47	4.50	4.41			
	31	32	4-axle	23.84	21.02	17.33	14.94	13.26	11.55	10.31	10.02	13.11	11.56	9.53	8.22	7.29	6.35	6.19	5.51	9.54	8.41	6.93	5.98	5.30	4.62	4.64	4.51	16.99	14.82	12.02	10.20	8.89	7.58	6.83	7.25	9.35	8.15	6.61	5.61	4.89	4.17	4.10	3.99	6.80	5.93	4.81	4.08	3.56	3.03	3.08	3.26			
Articulated	<23	<23	any axle	17.92	15.71	12.83	10.93	9.55	8.15	7.33	7.68	9.85	8.64	7.06	6.01	5.25	4.48	4.40	4.23	7.17	6.29	5.13	4.37	3.82	3.26	3.30	3.46	23.12	20.42	16.86	14.54	12.88	11.19	10.00	9.81	12.72	11.23	9.27	8.00	7.08	6.15	6.00	5.40	9.25	8.17	6.75	5.82	5.15	4.48	4.50	4.42			
	23	28	2-axle trailer	17.61	15.42	12.57	10.69	9.33	7.96	7.17	7.54	9.69	8.48	6.91	5.88	5.13	4.38	4.30	4.15	7.05	6.17	5.03	4.27	3.73	3.18	3.22	3.39	21.02	18.60	15.38	13.22	11.66	10.05	9.00	9.07	11.56	10.23	8.46	7.27	6.41	5.53	5.40	4.99	8.41	7.44	6.15	5.29	4.66	4.02	4.05	4.08			
	23	28	3-axle trailer	20.85	18.46	15.25	13.11	11.55	9.96	8.92	9.00	11.47	10.15	8.39	7.21	6.35	5.48	5.35	5.48	8.34	7.38	6.10	5.24	4.62	3.98	4.01	4.05	21.09	18.67	15.44	13.27	11.71	10.10	9.04	9.10	11.60	10.27	8.49	7.30	6.44	5.55	5.42	5.00	8.44	7.47	6.17	5.31	4.68	4.04	4.07	4.09			
	28	31	any axle	23.12	20.42	16.86	14.54	12.88	11.19	10.00	9.81	12.72	11.23	9.28	8.00	7.08	6.15	6.00	5.40	9.25	8.17	6.75	5.82	5.15	4.48	4.50	4.42	23.13	20.44	16.87	14.55	12.89	11.20	10.01	9.82	12.72	11.24	9.28	8.00	7.09	6.16	6.00	5.40	9.25	8.17	6.75	5.82	5.15	4.48	4.50	4.42			
	28	31	3-axle trailer	23.12	20.43	16.86	14.54	12.88	11.19	10.00	9.81	12.72	11.23	9.28	8.00	7.09	6.16	6.00	5.40	9.25	8.17	6.75	5.82	5.15	4.48	4.50	4.42	24.57	21.61	17.77	15.32	13.61	11.88	10.60	10.21	13.51	11.89	9.77	8.43	7.49	6.53	6.36	5.62	9.83	8.64	7.11	6.13	5.45	4.75	4.77	4.60			
	31	33	any axle	24.56	21.61	17.77	15.32	13.61	11.88	10.60	10.21	13.51	11.88	9.77	8.43	7.49	6.53	6.36	5.62	9.83	8.64	7.11	6.13	5.44	4.75	4.77	4.59	24.53	21.58	17.75	15.31	13.60	11.86	10.59	10.20	13.49	11.87	9.76	8.42	7.48	6.53	6.35	5.61	9.81	8.63	7.10	6.12	5.44	4.75	4.76	4.59			
	31	33	3-axle trailer	28.79	24.83	20.00	17.17	15.33	13.52	11.99	10.95	15.83	13.66	11.00	9.45	8.43	7.44	7.19	6.02	11.52	9.93	8.00	6.87	6.13	5.41	5.40	4.93	28.94	24.94	20.06	17.23	15.39	13.57	12.03	10.96	15.92	13.72	11.04	9.48	8.46	7.46	6.53	6.35	5.61	9.81	8.63	7.10	6.12	5.44	4.75	4.76	4.59		
	33	38	2+2 axle	29.02	25.00	20.10	17.26	15.41	13.60	12.05	10.97	15.96	13.75	11.06	9.49	8.46	7.46	7.22	6.03	11.58	9.98	8.03	6.89	6.15	5.43	5.41	4.93	27.59	23.94	19.41	16.70	14.90	13.10	11.64	10.79	15.17	13.17	10.68	9.19	8.19	7.21	6.99	5.94	5.14	5.04	4.86								
	33	38	3+3 axle	29.00	24.99	20.10	17.26	15.41	13.59	12.05	10.97	15.95	13.74	11.05	9.49	8.47	7.48	7.23	6.03	11.60	9.99	8.04	6.90	6.15	5.43	5.41	4.94	33	38	3+3 axle	30.62	26.15	20.82	17.83	15.94	14.10	12.46	11.11	16.84	14.38	11.45	9.81	8.76	7.75	7.48	6.11	12.25	10.46	8.33	7.13	6.37	5.64	5.61	5.00
	38	40	5-axle	32.37	27.37	21.55	18.39	16.45	14.59	12.85	11.21	17.81	15.06	11.85	10.11	9.05	8.03	7.71	6.16	12.95	10.95	8.62	7.36	6.58	5.84	5.78	5.04	40	41	6-axle	34.96	29.14	22.55	19.13	17.12	15.24	13.34	11.25	19.23	16.03	12.40	10.52	9.42	8.38	8.01	6.19	13.99	11.66	9.02	7.65	6.85	6.10	6.00	5.06
	41	44	6-axle	34.96	29.14	22.55	19.13	17.12	15.24	13.34	11.25	19.23	16.03	12.40	10.52	9.42	8.38	8.01	6.19	13.99	11.66	9.02	7.65	6.85	6.10	6.00	5.06																											

**Emission Reduction Scaling Factors for Different Technical Options and Future Regulations
Reductions relative to Euro II vehicles on current diesel; applies to all HGV sizes**

	Speed band							
	1	2	3	4	5	6	7	8
Euro II on ultra-low sulphur diesel (Fuel 2005)	0.941	0.941	0.941	0.941	0.941	0.941	0.993	0.993
Euro III	0.688	0.688	0.688	0.688	0.688	0.688	0.688	0.688
Euro III on ultra-low sulphur diesel (Fuel 2005)	0.652	0.652	0.652	0.652	0.652	0.652	0.688	0.688
Euro IV on ultra-low sulphur diesel (Fuel 2005)	0.490	0.490	0.490	0.490	0.490	0.490	0.490	0.490
Euro IV+ (2008) on ultra-low sulphur diesel (Fuel 2005)	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280
Euro II retrofitted with CRT on ULS diesel (Fuel 2005)	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830

Table E.2: PM₁₀ Emission Factors for HGVs (in g/km)

Type	Weight (tonnes)	Configuration	Pre-EURO I											EURO I											EURO II																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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			10	13	18	23	28	35	45	55	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
Rigids	3.5	7.5	2-axle	0.744	0.610	0.454	0.369	0.316	0.272	0.249	0.236	0.484	0.396	0.295	0.240	0.206	0.177	0.162	0.166	0.342	0.280	0.209	0.170	0.145	0.125	0.115	0.118	0.964	0.791	0.598	0.495	0.434	0.382	0.349	0.338	0.626	0.514	0.389	0.322	0.282	0.248	0.227	0.220	0.443	0.364	0.275	0.228	0.200	0.176	0.160	0.155	1.038	0.855	0.651	0.543	0.479	0.425	0.391	0.380	0.675	0.556	0.423	0.353	0.312	0.276	0.254	0.247	0.477	0.393	0.299	0.250	0.220	0.195	0.180	0.175	1.055	0.870	0.664	0.556	0.491	0.436	0.403	0.393	0.686	0.566	0.432	0.361	0.319	0.283	0.262	0.256	0.485	0.400	0.305	0.255	0.226	0.200	0.185	0.181	1.067	0.882	0.675	0.565	0.500	0.445	0.412	0.405	0.694	0.573	0.439	0.367	0.325	0.289	0.268	0.263	0.491	0.405	0.310	0.260	0.230	0.205	0.190	0.186	1.079	0.895	0.689	0.579	0.513	0.458	0.427	0.426	0.702	0.582	0.448	0.376	0.334	0.298	0.278	0.277	0.310	0.257	0.198	0.166	0.147	0.132	0.123	0.122	1.081	0.898	0.693	0.583	0.517	0.462	0.433	0.435	0.703	0.584	0.450	0.379	0.336	0.300	0.281	0.283	0.311	0.258	0.199	0.167	0.149	0.133	0.124	0.125																																																																																																																																																																																																																																																																																																																								
Rigids	17	21	3-axle	1.074	0.898	0.697	0.588	0.522	0.468	0.443	0.454	0.698	0.584	0.453	0.382	0.340	0.304	0.288	0.295	0.309	0.258	0.200	0.169	0.150	0.134	0.127	0.131	1.063	0.893	0.697	0.589	0.523	0.468	0.446	0.465	0.691	0.580	0.453	0.383	0.340	0.304	0.290	0.302	0.305	0.257	0.200	0.169	0.150	0.135	0.128	0.134	1.054	0.889	0.696	0.589	0.523	0.468	0.446	0.470	0.685	0.578	0.453	0.383	0.340	0.304	0.290	0.306	0.303	0.255	0.200	0.169	0.150	0.134	0.128	0.135	1.051	0.888	0.697	0.590	0.523	0.468	0.447	0.472	0.683	0.577	0.453	0.383	0.340	0.304	0.290	0.307	0.302	0.255	0.200	0.169	0.150	0.134	0.128	0.136																																																																																																																																																																																																																																																																																																																																																																																																
Rigids	26	31	4-axle	1.078	0.915	0.721	0.609	0.539	0.478	0.449	0.467	0.701	0.595	0.468	0.396	0.350	0.310	0.292	0.303	0.310	0.263	0.207	0.175	0.155	0.137	0.129	0.134	1.097	0.930	0.732	0.619	0.547	0.483	0.451	0.463	0.713	0.605	0.476	0.402	0.356	0.314	0.293	0.301	0.315	0.267	0.210	0.178	0.157	0.139	0.130	0.133																																																																																																																																																																																																																																																																																																																																																																																																																																																
Articul- ated	<23	<23	any axle	1.075	0.898	0.697	0.588	0.522	0.467	0.442	0.453	0.699	0.584	0.453	0.382	0.339	0.304	0.287	0.294	0.309	0.258	0.200	0.169	0.150	0.134	0.127	0.130	1.067	0.895	0.697	0.589	0.523	0.468	0.445	0.462	0.693	0.582	0.453	0.383	0.340	0.304	0.289	0.300	0.307	0.257	0.200	0.169	0.150	0.135	0.128	0.133	1.070	0.896	0.697	0.589	0.523	0.468	0.444	0.459	0.695	0.582	0.453	0.383	0.340	0.304	0.289	0.298	0.307	0.257	0.200	0.169	0.150	0.135	0.128	0.132	1.051	0.891	0.700	0.593	0.526	0.469	0.447	0.472	0.683	0.579	0.455	0.385	0.342	0.305	0.290	0.307	0.302	0.256	0.201	0.170	0.151	0.135	0.128	0.136	1.051	0.890	0.700	0.592	0.525	0.469	0.447	0.472	0.683	0.578	0.455	0.385	0.341	0.305	0.290	0.307	0.302	0.256	0.201	0.170	0.151	0.135	0.128	0.136	1.052	0.891	0.701	0.593	0.526	0.469	0.447	0.472	0.684	0.579	0.456	0.385	0.342	0.305	0.290	0.307	0.302	0.256	0.201	0.170	0.151	0.135	0.128	0.136	1.079	0.915	0.721	0.610	0.539	0.478	0.449	0.467	0.701	0.595	0.469	0.396	0.351	0.311	0.292	0.303	0.310	0.263	0.207	0.175	0.155	0.137	0.129	0.134	1.079	0.916	0.721	0.610	0.539	0.478	0.449	0.467	0.701	0.595	0.469	0.396	0.351	0.311	0.292	0.303	0.310	0.263	0.207	0.175	0.155	0.137	0.129	0.134	1.079	0.915	0.721	0.610	0.539	0.478	0.449	0.467	0.701	0.595	0.469	0.396	0.351	0.311	0.292	0.303	0.310	0.263	0.207	0.175	0.155	0.137	0.129	0.134	1.119	0.948	0.746	0.630	0.557	0.490	0.453	0.459	0.727	0.616	0.485	0.410	0.362	0.319	0.295	0.299	0.321	0.272	0.214	0.181	0.160	0.141	0.130	0.132	1.119	0.948	0.746	0.630	0.557	0.490	0.453	0.459	0.727	0.616	0.485	0.410	0.362	0.319	0.295	0.299	0.321	0.272	0.214	0.181	0.160	0.141	0.130	0.132	1.117	0.947	0.745	0.630	0.556	0.490	0.453	0.460	0.726	0.616	0.484	0.409	0.361	0.318	0.295	0.299	0.321	0.272	0.214	0.181	0.160	0.141	0.130	0.132	1.319	1.107	0.863	0.726	0.639	0.553	0.481	0.431	0.857	0.719	0.561	0.472	0.415	0.360	0.313	0.280	0.379	0.318	0.248	0.209	0.184	0.159	0.138	0.124	1.328	1.114	0.868	0.730	0.642	0.556	0.483	0.430	0.863	0.724	0.564	0.475	0.418	0.362	0.314	0.279	0.382	0.320	0.249	0.210	0.185	0.160	0.139	0.123	1.333	1.118	0.871	0.733	0.644	0.558	0.483	0.429	0.866	0.727	0.566	0.476	0.419	0.363	0.314	0.279	0.383	0.321	0.250	0.211	0.185	0.160	0.139	0.123	1.251	1.054	0.824	0.694	0.611	0.532	0.471	0.440	0.813	0.685	0.535	0.451	0.397	0.346	0.306	0.286	0.360	0.303	0.237	0.199	0.176	0.153	0.135	0.126	1.332	1.117	0.870	0.732	0.644	0.557	0.483	0.429	0.866	0.726	0.566	0.476	0.419	0.362	0.314	0.279	0.383	0.321	0.250	0.210	0.185	0.160	0.139	0.123	1.436	1.198	0.929	0.781	0.686	0.591	0.500	0.417	0.933	0.779	0.604	0.508	0.446	0.384	0.325	0.271	0.413	0.344	0.267	0.224	0.197	0.170	0.144	0.120	1.560	1.295	1.000	0.839	0.736	0.631	0.520	0.404	1.014	0.842	0.650	0.545	0.479	0.410	0.338	0.262	0.448	0.372	0.287	0.241	0.212	0.181	0.149	0.116	1.762	1.453	1.113	0.933	0.818	0.697	0.554	0.384	1.145	0.944	0.724	0.606	0.532	0.453	0.360	0.250	0.506	0.417	0.320	0.268	0.235	0.200	0.159	0.110

**Emission Reduction Scaling Factors for Different Technical Options and Future Regulations
Reductions relative to Euro II vehicles on current diesel; applies to all HGV sizes**

	Speed Band							
	1	2	3	4	5	6	7	8
Euro II on ultra-low sulphur diesel (Fuel 2005)	0.916	0.916	0.916	0.916	0.916	0.916	0.967	0.967
Euro III diesel (Fuel 2005)	0.716	0.716	0.716	0.716	0.716	0.716	0.716	0.716
Euro IV on ultra-low sulphur diesel (Fuel 2005)	0.660	0.660	0.660	0.660	0.660	0.660	0.697	0.697
Euro IV+ (2008) on ultra-low sulphur diesel (Fuel 2005)	0.147	0.147	0.147	0.147	0.147	0.147	0.147	0.147
Euro II retrofitted with CRT on ULS diesel (Fuel 2005)	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180

**Scaling Factors for Finer Particle Sizes Relative to PM10
Assume the same scaling factors hold for all speeds, road types, ULS diesel and other abatement technologies**

PM2.5	0.9
PM1	0.85
PM0.1	0.5

**Emission Reduction Scaling Factors for Different Technical Options and Future Regulations
Reductions relative to Euro II vehicles on current diesel; applies to all HGV sizes**

	Speed Band							
	1	2	3	4	5	6	7	8
Euro II on ultra-low sulphur diesel (Fuel 2005)	0.956	0.956	0.956	0.956	0.956	0.956	1.009	1.009
Euro III	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Euro III on ultra-low sulphur diesel (Fuel 2005)	0.947	0.947	0.947	0.947	0.947	0.947	1.000	1.000
Euro IV on ultra-low sulphur diesel (Fuel 2005)	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Euro IV+ (2008) on ultra-low sulphur diesel (Fuel 2005)	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Euro II retrofitted with CRT on ULS diesel (Fuel 2005)	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100

Table E.4: NMVOC Emission Factors for HGVs (in g/km)

Type	Weight (tonnes)	Configuration	Pre-EURO I										EURO I										EURO II									
			Speed Band					Speed Band					Speed Band					Speed Band					Speed Band									
			10	13	2	3	18	23	4	5	28	35	45	55	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	
Rigids	3.5	7.5	2-axle	3.99	3.23	2.35	1.87	1.55	1.23	0.94	0.70	2.99	2.42	1.77	1.40	1.16	0.92	0.70	0.52	2.79	2.26	1.65	1.31	1.09	0.86	0.66	0.49					
	7.5	12	2-axle	3.97	3.14	2.30	1.89	1.65	1.39	1.12	0.85	2.98	2.35	1.73	1.42	1.23	1.04	0.84	0.64	2.78	2.20	1.61	1.33	1.15	0.97	0.78	0.60					
	12	13	2-axle	3.95	3.11	2.29	1.89	1.66	1.41	1.15	0.89	2.97	2.34	1.72	1.42	1.24	1.06	0.87	0.67	2.77	2.18	1.60	1.33	1.16	0.99	0.81	0.63					
	13	14	2-axle	3.95	3.11	2.29	1.89	1.65	1.41	1.15	0.90	2.96	2.33	1.71	1.42	1.24	1.06	0.86	0.67	2.76	2.18	1.60	1.32	1.16	0.99	0.81	0.63					
	14	15	2-axle	3.94	3.11	2.29	1.89	1.65	1.40	1.15	0.90	2.95	2.33	1.72	1.42	1.24	1.05	0.86	0.67	2.76	2.18	1.60	1.32	1.15	0.98	0.80	0.63					
	15	17	2-axle	3.92	3.12	2.29	1.88	1.63	1.37	1.12	0.89	1.96	1.56	1.15	0.94	0.81	0.69	0.73	0.67	1.77	1.40	1.03	0.85	0.73	0.62	0.67	0.58					
	17	18	2-axle	3.91	3.12	2.29	1.87	1.61	1.35	1.10	0.88	1.96	1.56	1.15	0.94	0.81	0.68	0.71	0.66	1.76	1.40	1.03	0.84	0.73	0.61	0.66	0.57					
Rigids	17	21	3-axle	3.89	3.14	2.31	1.85	1.57	1.28	1.03	0.85	1.94	1.57	1.15	0.93	0.78	0.64	0.67	0.63	1.75	1.41	1.04	0.83	0.70	0.58	0.62	0.55					
	21	23	3-axle	3.86	3.15	2.32	1.84	1.53	1.22	0.97	0.81	1.93	1.58	1.16	0.92	0.76	0.61	0.63	0.61	1.74	1.42	1.04	0.83	0.69	0.55	0.58	0.53					
	23	25	3-axle	3.84	3.16	2.32	1.82	1.49	1.17	0.92	0.78	1.92	1.58	1.16	0.91	0.75	0.59	0.60	0.59	1.73	1.42	1.05	0.82	0.67	0.53	0.55	0.51					
	25	26	3-axle	3.83	3.17	2.33	1.81	1.47	1.15	0.90	0.77	1.92	1.58	1.16	0.91	0.74	0.57	0.58	0.58	1.72	1.43	1.05	0.82	0.66	0.52	0.54	0.50					
Rigids	26	31	4-axle	3.77	3.16	2.32	1.79	1.43	1.09	0.84	0.74	1.89	1.58	1.16	0.89	0.71	0.54	0.55	0.55	1.70	1.42	1.04	0.80	0.64	0.49	0.51	0.48					
	31	32	4-axle	3.76	3.14	2.31	1.78	1.43	1.09	0.85	0.74	1.88	1.57	1.16	0.89	0.71	0.55	0.55	0.56	1.69	1.42	1.04	0.80	0.64	0.49	0.51	0.48					
Articulated	<23	31	any axle	3.89	3.14	2.30	1.86	1.57	1.29	1.04	0.85	1.94	1.57	1.15	0.93	0.79	0.64	0.68	0.64	1.75	1.41	1.04	0.84	0.71	0.58	0.62	0.55					
	<23	23	2-axle trailer	3.87	3.15	2.31	1.84	1.54	1.24	0.99	0.82	1.94	1.57	1.16	0.92	0.77	0.62	0.65	0.62	1.74	1.42	1.04	0.83	0.69	0.56	0.60	0.54					
	23	28	3-axle trailer	3.88	3.14	2.31	1.85	1.55	1.26	1.01	0.83	1.94	1.57	1.15	0.92	0.78	0.63	0.66	0.62	1.74	1.41	1.04	0.83	0.70	0.57	0.61	0.54					
	23	28	any axle	3.81	3.17	2.33	1.80	1.45	1.11	0.87	0.75	1.91	1.58	1.16	0.90	0.73	0.56	0.56	0.56	1.72	1.43	1.05	0.81	0.65	0.50	0.52	0.49					
	23	28	2-axle trailer	3.81	3.17	2.33	1.80	1.46	1.12	0.87	0.75	1.91	1.58	1.16	0.90	0.73	0.56	0.57	0.56	1.72	1.43	1.05	0.81	0.65	0.50	0.52	0.49					
	23	28	3-axle trailer	3.81	3.17	2.33	1.80	1.45	1.11	0.86	0.75	1.91	1.58	1.16	0.90	0.73	0.56	0.56	0.56	1.71	1.43	1.05	0.81	0.65	0.50	0.52	0.49					
	28	31	any axle	3.77	3.16	2.32	1.79	1.43	1.09	0.84	0.74	1.89	1.58	1.16	0.89	0.71	0.54	0.55	0.55	1.70	1.42	1.04	0.80	0.64	0.49	0.51	0.48					
	28	31	2-axle trailer	3.77	3.16	2.32	1.79	1.43	1.09	0.84	0.74	1.89	1.58	1.16	0.89	0.71	0.54	0.55	0.55	1.70	1.42	1.04	0.80	0.64	0.49	0.51	0.48					
	28	31	3-axle trailer	3.77	3.16	2.32	1.79	1.43	1.09	0.84	0.74	1.89	1.58	1.16	0.89	0.71	0.54	0.55	0.55	1.70	1.42	1.04	0.80	0.64	0.49	0.51	0.48					
	31	33	any axle	3.75	3.13	2.30	1.78	1.43	1.10	0.86	0.75	1.88	1.57	1.15	0.89	0.72	0.55	0.56	0.57	1.69	1.41	1.04	0.80	0.65	0.50	0.52	0.49					
	31	33	2-axle trailer	3.75	3.13	2.30	1.78	1.43	1.10	0.86	0.75	1.88	1.57	1.15	0.89	0.72	0.55	0.56	0.57	1.69	1.41	1.04	0.80	0.65	0.50	0.52	0.49					
	31	33	3-axle trailer	3.75	3.13	2.30	1.78	1.43	1.10	0.86	0.75	1.88	1.57	1.15	0.89	0.72	0.55	0.56	0.56	1.69	1.41	1.04	0.80	0.65	0.49	0.52	0.49					
	33	38	2+2 axle	3.70	3.00	2.22	1.80	1.53	1.26	1.04	0.88	1.85	1.50	1.11	0.90	0.76	0.63	0.68	0.66	1.67	1.35	1.00	0.81	0.69	0.57	0.62	0.57					
	33	38	2+3 axle	3.70	3.00	2.22	1.80	1.53	1.27	1.05	0.89	1.85	1.50	1.11	0.90	0.77	0.64	0.68	0.67	1.66	1.35	1.00	0.81	0.69	0.57	0.63	0.58					
	33	38	3+any axle	3.70	3.00	2.22	1.80	1.54	1.28	1.05	0.89	1.85	1.50	1.11	0.90	0.77	0.64	0.68	0.67	1.66	1.35	1.00	0.81	0.69	0.57	0.63	0.58					
	33	38	3+2 axle	3.71	3.05	2.25	1.79	1.49	1.20	0.97	0.83	1.86	1.52	1.13	0.90	0.75	0.60	0.63	0.63	1.67	1.37	1.01	0.81	0.67	0.54	0.58	0.54					
	33	38	3+3 axle	3.70	3.00	2.22	1.80	1.54	1.28	1.05	0.89	1.85	1.50	1.11	0.90	0.77	0.64	0.68	0.67	1.66	1.35	1.00	0.81	0.69	0.57	0.63	0.58					
	38	40	5-axle	3.68	2.93	2.18	1.81	1.60	1.38	1.16	0.97	1.84	1.46	1.09	0.91	0.80	0.69	0.76	0.73	1.66	1.32	0.98	0.82	0.72	0.62	0.70	0.63					
	40	41	6-axle	3.67	2.85	2.13	1.83	1.67	1.51	1.30	1.06	1.83	1.42	1.06	0.92	0.84	0.75	0.85	0.80	1.65	1.28	0.96	0.82	0.75	0.68	0.78	0.69					
	41	44	6-axle	3.65	2.72	2.04	1.87	1.80	1.73	1.53	1.22	1.83	1.36	1.02	0.93	0.90	0.86	1.00	0.92	1.64	1.22	0.92	0.84	0.81	0.78	0.92	0.80					

**Emission Reduction Scaling Factors for Different Technical Options and Future Regulations
Reductions relative to Euro II vehicles on current diesel; applies to all HGV sizes**

	Speed Band							
	1	2	3	4	5	6	7	8
Euro II on ultra-low sulphur diesel (Fuel 2005)	0.970	0.970	0.970	0.970	0.970	0.970	1.024	1.024
Euro III	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Euro III on ultra-low sulphur diesel (Fuel 2005)	0.947	0.947	0.947	0.947	0.947	0.947	1.000	1.000
Euro IV on ultra-low sulphur diesel (Fuel 2005)	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120
Euro IV+ (2008) on ultra-low sulphur diesel (Fuel 2005)	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120
Euro II retrofitted with CRT on ULS diesel (Fuel 2005)	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120

Table E.5: Benzene Emission Factors for HGVs (in g/km)

Type	Weight (tonnes)	Configuration	Pre-EURO I Speed Band										EURO I Speed Band										EURO II Speed Band																																																																																																																																																																																																																																																																																																																																																																		
			10	1	2	3	4	5	28	35	45	55	1	2	3	4	5	6	7	8	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8																																																																																																																																																																																																																																																																																																																																																				
Rigids	3.5	7.5	2-axle	0.0798	0.0645	0.0471	0.0373	0.0310	0.0246	0.0188	0.0140	0.0598	0.0484	0.0353	0.0280	0.0233	0.0185	0.0141	0.0105	0.0558	0.0452	0.0330	0.0261	0.0217	0.0172	0.0131	0.0098	0.0794	0.0627	0.0460	0.0379	0.0329	0.0278	0.0224	0.0171	0.0596	0.0471	0.0345	0.0284	0.0247	0.0209	0.0168	0.0128	0.0556	0.0439	0.0322	0.0265	0.0230	0.0195	0.0157	0.0120	0.0791	0.0623	0.0458	0.0379	0.0332	0.0283	0.0231	0.0179	0.0593	0.0467	0.0343	0.0284	0.0249	0.0212	0.0173	0.0134	0.0554	0.0436	0.0320	0.0265	0.0232	0.0198	0.0162	0.0125	0.0789	0.0622	0.0457	0.0378	0.0331	0.0282	0.0231	0.0180	0.0592	0.0467	0.0343	0.0284	0.0248	0.0212	0.0173	0.0135	0.0553	0.0436	0.0320	0.0265	0.0232	0.0198	0.0161	0.0126	0.0788	0.0622	0.0457	0.0378	0.0330	0.0281	0.0229	0.0180	0.0591	0.0467	0.0343	0.0283	0.0247	0.0210	0.0172	0.0135	0.0551	0.0436	0.0320	0.0264	0.0231	0.0196	0.0160	0.0126	0.0784	0.0623	0.0458	0.0376	0.0325	0.0274	0.0224	0.0178	0.0392	0.0312	0.0229	0.0188	0.0163	0.0137	0.0145	0.0133	0.0353	0.0280	0.0206	0.0169	0.0146	0.0124	0.0134	0.0116	0.0783	0.0624	0.0459	0.0375	0.0323	0.0270	0.0220	0.0176	0.0391	0.0312	0.0229	0.0187	0.0161	0.0135	0.0143	0.0132	0.0352	0.0281	0.0206	0.0169	0.0145	0.0122	0.0132	0.0114																																																																																																																																																																																																														
Rigids	17	21	3-axle	0.0777	0.0628	0.0461	0.0371	0.0313	0.0257	0.0206	0.0169	0.0389	0.0314	0.0231	0.0185	0.0157	0.0128	0.0134	0.0127	0.0350	0.0282	0.0208	0.0167	0.0141	0.0115	0.0124	0.0110	0.0773	0.0631	0.0463	0.0367	0.0305	0.0245	0.0195	0.0162	0.0386	0.0315	0.0232	0.0184	0.0153	0.0122	0.0126	0.0122	0.0348	0.0284	0.0208	0.0165	0.0137	0.0110	0.0117	0.0106	0.0768	0.0633	0.0465	0.0364	0.0298	0.0234	0.0184	0.0156	0.0384	0.0316	0.0232	0.0182	0.0149	0.0117	0.0120	0.0117	0.0346	0.0285	0.0209	0.0164	0.0134	0.0105	0.0111	0.0102	0.0766	0.0633	0.0465	0.0363	0.0295	0.0229	0.0180	0.0154	0.0383	0.0317	0.0233	0.0181	0.0147	0.0115	0.0117	0.0115	0.0345	0.0285	0.0209	0.0163	0.0133	0.0103	0.0108	0.0100																																																																																																																																																																																																																																																																																						
Rigids	26	31	4-axle	0.0755	0.0631	0.0464	0.0357	0.0286	0.0217	0.0168	0.0148	0.0377	0.0316	0.0232	0.0179	0.0143	0.0109	0.0111	0.0340	0.0284	0.0209	0.0161	0.0129	0.0098	0.0101	0.0096	0.0753	0.0629	0.0462	0.0357	0.0286	0.0218	0.0170	0.0149	0.0376	0.0314	0.0231	0.0178	0.0143	0.0109	0.0110	0.0112	0.0339	0.0283	0.0208	0.0161	0.0129	0.0098	0.0102	0.0097																																																																																																																																																																																																																																																																																																																																							
Articulated	<23		any axle	0.0778	0.0627	0.0461	0.0371	0.0314	0.0258	0.0208	0.0170	0.0389	0.0314	0.0230	0.0186	0.0157	0.0129	0.0135	0.0127	0.0350	0.0282	0.0207	0.0167	0.0141	0.0116	0.0125	0.0110	0.0774	0.0630	0.0462	0.0369	0.0308	0.0249	0.0199	0.0165	0.0387	0.0315	0.0231	0.0184	0.0154	0.0124	0.0129	0.0124	0.0348	0.0283	0.0208	0.0166	0.0139	0.0112	0.0119	0.0107	0.0776	0.0629	0.0462	0.0369	0.0310	0.0252	0.0202	0.0166	0.0388	0.0314	0.0231	0.0185	0.0155	0.0126	0.0131	0.0125	0.0349	0.0283	0.0208	0.0166	0.0140	0.0113	0.0121	0.0108	0.0763	0.0634	0.0465	0.0361	0.0291	0.0224	0.0174	0.0151	0.0381	0.0317	0.0233	0.0180	0.0146	0.0112	0.0113	0.0113	0.0343	0.0285	0.0209	0.0162	0.0131	0.0101	0.0105	0.0098	0.0762	0.0634	0.0465	0.0360	0.0290	0.0223	0.0173	0.0150	0.0381	0.0317	0.0233	0.0180	0.0145	0.0111	0.0112	0.0112	0.0343	0.0285	0.0209	0.0162	0.0131	0.0100	0.0104	0.0097	0.0755	0.0631	0.0464	0.0357	0.0286	0.0217	0.0168	0.0148	0.0377	0.0316	0.0232	0.0179	0.0143	0.0109	0.0111	0.0340	0.0284	0.0209	0.0161	0.0129	0.0098	0.0101	0.0096	0.0755	0.0631	0.0464	0.0357	0.0286	0.0217	0.0168	0.0148	0.0377	0.0316	0.0232	0.0179	0.0143	0.0109	0.0110	0.0340	0.0284	0.0209	0.0161	0.0129	0.0098	0.0101	0.0096	0.0750	0.0626	0.0461	0.0357	0.0287	0.0220	0.0172	0.0151	0.0375	0.0313	0.0230	0.0178	0.0143	0.0110	0.0112	0.0338	0.0282	0.0207	0.0160	0.0129	0.0099	0.0103	0.0098	0.0751	0.0626	0.0461	0.0357	0.0287	0.0220	0.0172	0.0151	0.0375	0.0313	0.0230	0.0178	0.0143	0.0110	0.0112	0.0338	0.0282	0.0207	0.0160	0.0129	0.0099	0.0103	0.0098	0.0740	0.0601	0.0445	0.0360	0.0306	0.0253	0.0208	0.0176	0.0370	0.0300	0.0222	0.0180	0.0153	0.0126	0.0135	0.0332	0.0270	0.0200	0.0162	0.0138	0.0114	0.0125	0.0115	0.0740	0.0600	0.0444	0.0360	0.0307	0.0255	0.0210	0.0178	0.0370	0.0300	0.0222	0.0180	0.0153	0.0127	0.0136	0.0333	0.0270	0.0200	0.0162	0.0138	0.0115	0.0126	0.0115	0.0743	0.0609	0.0450	0.0358	0.0298	0.0240	0.0194	0.0167	0.0371	0.0305	0.0225	0.0179	0.0149	0.0120	0.0126	0.0334	0.0274	0.0203	0.0161	0.0134	0.0108	0.0117	0.0108	0.0740	0.0599	0.0444	0.0360	0.0307	0.0255	0.0211	0.0178	0.0370	0.0300	0.0222	0.0180	0.0154	0.0128	0.0137	0.0333	0.0270	0.0200	0.0162	0.0138	0.0115	0.0126	0.0116	0.0737	0.0586	0.0435	0.0363	0.0319	0.0276	0.0233	0.0194	0.0368	0.0293	0.0218	0.0181	0.0160	0.0138	0.0151	0.0331	0.0264	0.0196	0.0163	0.0144	0.0124	0.0140	0.0126	0.0734	0.0570	0.0425	0.0367	0.0335	0.0302	0.0260	0.0213	0.0367	0.0285	0.0213	0.0183	0.0167	0.0151	0.0169	0.0330	0.0256	0.0191	0.0165	0.0151	0.0136	0.0156	0.0138	0.0730	0.0544	0.0409	0.0373	0.0361	0.0345	0.0307	0.0245	0.0365	0.0272	0.0204	0.0187	0.0180	0.0173	0.0199	0.0184	0.0329	0.0245	0.0184	0.0168	0.0162	0.0155	0.0184	0.0159

**Emission Reduction Scaling Factors for Different Technical Options and Future Regulations
Reductions relative to Euro II vehicles on current diesel; applies to all HGV sizes**

	Speed Band							
	1	2	3	4	5	6	7	8
Euro II on ultra-low sulphur diesel (Fuel 2005)	0.970	0.970	0.970	0.970	0.970	0.970	1.024	1.024
Euro III	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Euro III on ultra-low sulphur diesel (Fuel 2005)	0.947	0.947	0.947	0.947	0.947	0.947	1.000	1.000
Euro IV on ultra-low sulphur diesel (Fuel 2005)	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120
Euro IV+ (2008) on ultra-low sulphur diesel (Fuel 2005)	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120
Euro II retrofitted with CRT on ULS diesel (Fuel 2005)	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120

**Emission Reduction Scaling Factors for Different Technical Options and Future Regulations
Reductions relative to Euro II vehicles on current diesel; applies to all HGV sizes**

	Speed Band							
	1	2	3	4	5	6	7	8
Euro II on ultra-low sulphur diesel (Fuel 2005)	0.970	0.970	0.970	0.970	0.970	0.970	1.024	1.024
Euro III	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Euro III on ultra-low sulphur diesel (Fuel 2005)	0.947	0.947	0.947	0.947	0.947	0.947	1.000	1.000
Euro IV on ultra-low sulphur diesel (Fuel 2005)	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120
Euro IV+ (2008) on ultra-low sulphur diesel (Fuel 2005)	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120
Euro II retrofitted with CRT on ULS diesel (Fuel 2005)	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.120

Table E.7: CO2 Emission Factors for HGVs (in g CO2/km)

Type	Weight (tonnes)	Configuration	Pre-EURO I TO EURO II Speed Band Speed (mph)									
			1	2	3	4	5	6	7	8		
			10	13	18	23	28	35	45	55		
Rigids	3.5	7.5	2-axle	701	588	461	395	362	350	388	479	
	7.5	12	2-axle	780	689	573	502	458	434	469	572	
	12	13	2-axle	878	784	662	582	530	496	523	624	
	13	14	2-axle	920	824	697	613	558	519	542	641	
	14	15	2-axle	965	864	732	645	586	543	561	658	
	15	17	2-axle	1061	950	805	709	644	592	600	690	
	17	18	2-axle	1111	995	842	742	673	616	619	706	
	17	21	3-axle	1254	1120	945	832	754	684	670	747	
	21	23	3-axle	1366	1218	1026	903	817	737	709	778	
	23	25	3-axle	1463	1303	1097	965	872	783	744	807	
25	26	3-axle	1508	1343	1131	995	899	804	761	821		
Rigids	26	31	4-axle	1679	1503	1275	1124	1013	899	835	895	
	31	32	4-axle	1701	1528	1300	1147	1033	915	849	913	
Articul- ated	<23	any axle	1240	1108	935	823	746	665	678	743		
	<23	2-axle trailer	1327	1184	998	878	795	696	718	767		
	<23	3-axle trailer	1299	1159	977	860	779	686	705	759		
	23	any axle	1578	1406	1185	1043	941	840	840	846		
	23	2-axle trailer	1567	1396	1177	1036	935	834	834	842		
	23	2-axle trailer	1582	1410	1189	1046	944	842	842	848		
	28	31	any axle	1679	1504	1276	1125	1014	899	836	896	
	28	31	2-axle trailer	1680	1505	1276	1125	1014	899	836	896	
	28	31	3-axle trailer	1680	1504	1276	1125	1014	899	836	896	
	31	33	any axle	1716	1546	1320	1166	1050	929	862	929	
	31	33	2-axle trailer	1715	1546	1320	1166	1050	929	862	929	
	31	33	3-axle trailer	1715	1545	1319	1165	1050	928	861	928	
	33	38	2+2 axle	1696	1572	1384	1232	1108	974	914	1018	
	33	38	2+3-axle	1693	1571	1385	1234	1109	975	915	1021	
	33	38	3+any axle	1691	1570	1385	1234	1109	975	916	1022	
	33	38	3+2 axle	1717	1577	1374	1220	1098	966	902	993	
33	38	3+3 axle	1691	1570	1385	1234	1109	975	916	1022		
38	40	5-axle	1645	1550	1389	1242	1116	980	928	1054		
40	41	6-axle	1579	1516	1384	1244	1117	980	938	1089		

41 44 6-axle 1455 1447 1364 1236 1109 972 949 1138

**Emission Reduction Scaling Factors for Different Technical Options and Future Regulations
Reductions relative to Euro II vehicles on current diesel; applies to all HGV sizes**

	Speed Band							
	1	2	3	4	5	6	7	8
Euro II on ultra-low sulphur diesel (Fuel 2005)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Euro III	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Euro III on ultra-low sulphur diesel (Fuel 2005)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Euro IV on ultra-low sulphur diesel (Fuel 2005)	0.970	0.970	0.970	0.970	0.970	0.970	0.970	0.970
Euro IV+ (2008) on ultra-low sulphur diesel (Fuel 2005)	0.970	0.970	0.970	0.970	0.970	0.970	0.970	0.970
Euro II retrofitted with CRT on ULS diesel (Fuel 2005)	0.985	0.985	0.985	0.985	0.985	0.985	0.985	0.985

Table E.8: SO2 Emission Factors for HGVs (in g/km)

Type	Weight (tonnes)	Configuration	Pre-EURO I to EURO II (1997 Diesel)								
			Speed Band								
			1 10	2 13	3 18	4 23	5 28	6 35	7 45	8 55	
Rigids	3.5	7.5 2-axle	0.179	0.150	0.117	0.101	0.092	0.089	0.099	0.122	
	7.5	12 2-axle	0.199	0.175	0.146	0.128	0.117	0.110	0.119	0.146	
	12	13 2-axle	0.223	0.200	0.169	0.148	0.135	0.126	0.133	0.159	
	13	14 2-axle	0.234	0.210	0.177	0.156	0.142	0.132	0.138	0.163	
	14	15 2-axle	0.246	0.220	0.186	0.164	0.149	0.138	0.143	0.168	
	15	17 2-axle	0.270	0.242	0.205	0.181	0.164	0.151	0.153	0.176	
	17	18 2-axle	0.283	0.253	0.214	0.189	0.171	0.157	0.157	0.180	
	Rigids	17	21 3-axle	0.319	0.285	0.241	0.212	0.192	0.174	0.171	0.190
		21	23 3-axle	0.348	0.310	0.261	0.230	0.208	0.188	0.181	0.198
		23	25 3-axle	0.372	0.332	0.279	0.246	0.222	0.199	0.189	0.205
		25	26 3-axle	0.384	0.342	0.288	0.253	0.229	0.205	0.194	0.209
		26	31 4-axle	0.427	0.383	0.325	0.286	0.258	0.229	0.213	0.228
		31	32 4-axle	0.433	0.389	0.331	0.292	0.263	0.233	0.216	0.232
	Articulated	<23	any axle	0.316	0.282	0.238	0.210	0.190	0.172	0.169	0.189
		<23	2-axle trailer	0.338	0.301	0.254	0.224	0.202	0.183	0.177	0.195
		<23	3-axle trailer	0.331	0.295	0.249	0.219	0.198	0.179	0.175	0.193
		23	28 any axle	0.402	0.358	0.302	0.266	0.240	0.214	0.201	0.215
23		28 2-axle trailer	0.399	0.355	0.300	0.264	0.238	0.212	0.199	0.214	
23		28 3-axle trailer	0.403	0.359	0.303	0.266	0.240	0.214	0.201	0.216	
28		31 any axle	0.428	0.383	0.325	0.286	0.258	0.229	0.213	0.228	
28		31 2-axle trailer	0.428	0.383	0.325	0.286	0.258	0.229	0.213	0.228	
31		33 any axle	0.437	0.394	0.336	0.297	0.267	0.236	0.219	0.236	
31		33 2-axle trailer	0.437	0.394	0.336	0.297	0.267	0.236	0.219	0.236	
31		33 3-axle trailer	0.437	0.393	0.336	0.297	0.267	0.236	0.219	0.236	
33		38 2+2 axle	0.432	0.400	0.352	0.314	0.282	0.248	0.233	0.259	
33		38 2+3-axle	0.431	0.400	0.353	0.314	0.282	0.248	0.233	0.260	
33		38 3+any axle	0.431	0.400	0.353	0.314	0.282	0.248	0.233	0.260	
33		38 3+2 axle	0.437	0.401	0.350	0.311	0.279	0.246	0.230	0.253	
33		38 3+3 axle	0.431	0.400	0.353	0.314	0.282	0.248	0.233	0.260	
38		40 5-axle	0.419	0.395	0.354	0.316	0.284	0.250	0.236	0.268	
40		41 6-axle	0.402	0.386	0.352	0.317	0.284	0.249	0.239	0.277	
41		44 6-axle	0.370	0.368	0.347	0.315	0.282	0.247	0.242	0.290	

**Emission Reduction Scaling Factors for Different Technical Options and Future Regulations
Reductions relative to Euro II vehicles on current diesel; applies to all HGV sizes**

	Speed Band							
	1	2	3	4	5	6	7	8
Euro II on ultra-low sulphur diesel (Fuel 2005)	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
Euro III	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Euro III on ultra-low sulphur diesel (Fuel 2005)	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
Euro IV on ultra-low sulphur diesel (Fuel 2005)	0.121	0.121	0.121	0.121	0.121	0.121	0.121	0.121
Euro IV+ (2008) on ultra-low sulphur diesel (Fuel 2005)	0.121	0.121	0.121	0.121	0.121	0.121	0.121	0.121
Euro II retrofitted with CRT on ULS diesel (Fuel 2005)	0.123	0.123	0.123	0.123	0.123	0.123	0.123	0.123

Table E.9: PM₁₀ Emission Factors for Tyre & Brake Wear from HGVs (in g/km)**NERA HGV Categories**

	Weight (tonnes)		Max	Configuration	Tyre Wear	Brake Wear
	Min	Max				
Rigids	3.5	7.5		2-axle	0.0018	0.0119
	7.5	12		2-axle	0.0018	0.0119
	12	13		2-axle	0.0018	0.0119
	13	14		2-axle	0.0018	0.0119
	14	15		2-axle	0.0018	0.0119
	15	17		2-axle	0.0018	0.0119
	17	18		2-axle	0.0018	0.0119
		17	21	3-axle	0.0024	0.0159
Rigids	21	23	3-axle	0.0024	0.0159	
	23	25	3-axle	0.0024	0.0159	
	25	26	3-axle	0.0024	0.0159	
		26				
Rigids	26	31	4-axle	0.0036	0.0239	
	31	32	4-axle	0.0036	0.0239	
Articulated	<23		any axle	0.0024	0.0159	
	<23		2-axle trailer	0.0030	0.0199	
	<23		3-axle trailer	0.0036	0.0239	
	23	28	any axle	0.0030	0.0199	
	23	28	2-axle trailer	0.0036	0.0239	
	23	28	3-axle trailer	0.0042	0.0278	
	28	31	any axle	0.0036	0.0239	
	28	31	2-axle trailer	0.0036	0.0239	
	28	31	3-axle trailer	0.0042	0.0278	
	31	33	any axle	0.0036	0.0239	
	31	33	2-axle trailer	0.0036	0.0239	
	31	33	3-axle trailer	0.0042	0.0278	
	33	38	2+2 axle	0.0036	0.0239	
	33	38	2+3-axle	0.0042	0.0278	
	33	38	3+any axle	0.0042	0.0278	
	33	38	3+2 axle	0.0042	0.0278	
	33	38	3+3 axle	0.0048	0.0318	
	38	40	5-axle	0.0042	0.0278	
	40	41	6-axle	0.0054	0.0358	
	41	44	6-axle	0.0054	0.0358	

Particle Size Fraction Relative to PM10

PM2.5	0.70	0.40
PM1	0.10	0.10
PM0.1	0.08	0.08