Appendix 3.10c: Estimation of NOx Composite Idling Emission Factor - HGV

First Registration Year	Age	No. of HGV(7) & HGV(8) [1]	Emission Standard [2]	% Population [3] [A]	Adjusted NOx Idling Emission Factors (g/h-veh) [4] [B]	Calculation [A] x [B]
2018	1	2,566	Euro V			
2017	2	2,080	Euro V			
2016	3	2,129	Euro V			
2015	4	2,167	Euro V			
2014	5	2,427	Euro V			
2013	6	1,702	Euro V	31.9%	45	14.37
2012	7	2,080	Euro IV			
2011	8	1,922	Euro IV			
2010	9	2,721	Euro IV			
2009	10	1,808	Euro IV			
2008	11	1,770	Euro IV			
2007	12	2,754	Euro IV	31.9%	45	14.35
2006	13	1,946	Euro III / IV			
2005	14	1,784	Euro III			
2004	15	2,171	Euro III			
2003	16	2,283	Euro III			
2002	17	2,599	Euro III	26.3%	68.75	18.11
2001	18	1,611	Euro II / III			
2000	19	875	Euro II			
1999	20	630	Euro II			
1998	21	436	Euro II	8.7%	102	8.85
1997	22	289	Euro I / II			
1996	23	84	Euro I	0.9%	153.25	1.40
1995	24	77	Pre- Euro / Euro I			
1994	25	13	Pre-Euro			
1993	26	1	Pre-Euro			
1992	27	3	Pre-Euro			
1991	28		Pre-Euro			
1990	29	1	Pre-Euro			
1989	30		Pre-Euro			
1988	31		Pre-Euro			
1987	32	1	Pre-Euro	0.2%	182.5	0.43
	Total	40,930		100.0%		57.51

Composite Emission Factor [5]	=	57.51 g/h-veh
Corrected Composite Emission Factor [6]	=	78.50 g/h-veh
Corrected Composite Emission Factor	=	1.308 g/min-veh

Notes:

(1) The vehicle population in 2018 is assumed to be the same as the latest vehicle population (2008) available from EPD's website.

(2) The emission standards are based on EPD's updated Guideline on Modelling Vehicle Emissions, Appendix II - Implementation Schedule of Vehicle Emission Standards in Hong Kong (June 2010).

(3) The % population is the proportion of HGVs with the same emission standards. For those years when two emission standards would be present, it is conservatively assumed that the less stringent standard would prevail in that year. For example, in 2006 it is assumed that all HGVs would comply with Euro III standard when calculating the corresponding % populution.

(4) The NOx idling emission factors for different emission standards are based on Tables II.3-46 to II.3-50, Appendix 2 of the "Road Tunnels: Vehicle Emission and Air Demand for Ventilation, PIARC, November 2004", and are adjusted by the mass factor of 2.5 according to Table II.3-51, Appendix 2 of the same publication. As the NOx idling emission factor for Euro V is not available from the publication, it is conservatively assumed that the emission factor is the same as that for Euro IV.

(5) The Composite Emission Factor is calculated as the population-weighted average of the NOx emission factors for various emission standards.

(6) The Corrected Composite Emission Factor is equal to the Composite Emission Factor multiplied by a factor of 1.05 to account for the China fuel usage and by another factor of 1.3 to account for additional air-conditioning loading.

Appendix 3.10c: Estimation of NOx Composite Idling Emission Factor - PC

First Registration Year	Age	No. of Petrol PC [1]	Emission Standard [2]	% Population [3]	Adjusted NOx Idling Emission Factors (g/h-veh) [4] [B]	Calculation [A] x [B]
2018	1	34,277	Euro V			
2017	2	32,257	Euro V			
2016	3	26,892	Euro V			
2015	4	26,072	Euro V			
2014	5	26,286	Euro V			
2013	6	21,660	Euro V	43.6%	0.28	0.122
2012	7	28,479	Euro IV			
2011	8	31,303	Euro IV			
2010	9	29,955	Euro IV			
2009	10	24,446	Euro IV			
2008	11	25,761	Euro IV			
2007	12	29,501	Euro IV			
2006	13	12,839	Euro IV	47.4%	0.28	0.133
2005	14	9,958	Euro III			
2004	15	10,522	Euro III			
2003	16	6,092	Euro III			
2002	17	3,441	Euro III			
2001	18	1,492	Euro III	8.2%	0.54	0.044
2000	19	860	Euro II			
1999	20	552	Euro II			
1998	21	352	Euro II	0.5%	0.69	0.003
1997	22	209	Euro I / II			
1996	23	175	Euro I	0.1%	3.00	0.003
1995	24	104	ULP / Euro I			
1994	25	42	ULP			
1993	26	32	ULP			
1992	27	87	ULP			
1991	28	85	Pre-ULP			
1990	29	84	Pre-ULP			
1989	30	43	Pre-ULP			
1988	31	44	Pre-ULP			
1987	32	41	Pre-ULP			
1986	33	23	Pre-ULP			
1985	34	23	Pre-ULP			
1984	35	35	Pre-ULP			
1983	36	47	Pre-ULP			
1982	37	25	Pre-ULP			
1981	38	16	Pre-ULP			
1980	39	26	Pre-ULP			
1979	40	11	Pre-ULP			
1978	41	4	Pre-ULP			
1977	42	6	Pre-ULP			
1976	43	3	Pre-ULP			
1975	44	2	Pre-ULP			
1974 or before	>44	19	Pre-ULP	0.2%	1.00	0.002
	Total	384,183		100.0%		0.307

Composite Emission Factor [5]	=	0.307 g/h-veh
Corrected Composite Emission Factor [6]	=	0.420 g/h-veh
Corrected Composite Emission Factor	=	0.007 g/min-veh

Notes:

(1) The vehicle population in 2018 is assumed to be the same as the latest vehicle population (2008) available from EPD's website and is taken as the population of Petrol PC + LGV(1).

(2) The emission standards are based on EPD's updated Guideline on Modelling Vehicle Emissions, Appendix II - Implementation Schedule of Vehicle Emission Standards in Hong Kong (June 2010).

(3) The % population is the proportion of Petrol PC with the same emission standards.   For those years when two or more emission standards would be present, it is conservatively assumed that the less stringent standard would prevail in that year. For example, in 1997 it is assumed that all PCs would comply with Euro I standard when calculating the corresponding % populution.

(4) The NOx idling emission factors for different emission standards are based on Tables II.3-20 to II.3-27, Appendix 2 of the "Road Tunnels: Vehicle Emission and Air Demand for Ventilation, PIARC, November 2004", and are adjusted by the aging factors of 2 for Euro III / Euro IV; 1.82 for Euro II and 3 for Euro I according to Tables II.3-22; II.3-24 and II.3-26, Appendix 2 of the same publication. As the NOx idling emission factor for Euro V is not available from the publication, it is conservatively assumed that the emission factor is the same as that for Euro IV.

(5) The Composite Emission Factor is calculated as the population-weighted average of the NOx emission factors for various emission standards.

(6) The Corrected Composite Emission Factor is equal to the Composite Emission Factor multiplied by a factor of 1.05 to account for the China fuel usage and by another factor of 1.3 to account for additional air-conditioning loading.