Supplementary Information

Article

Air Pollutant Emissions from Vehicles and Their Abatement Scenarios: A Case Study of Chengdu-Chongqing Urban Agglomeration, China

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Table 1. Vehicular emission standards implementation timetable in the CCUA, China.

Vehicle types	State I	State II	State III	State IV	State V
PC, LDV	2000/2001	2004/2006	2008	2012	/
BUS, HDT	2001	2005	2008	2015	/
MC	2002	2004	2010	/	/

Table 2. The predicted value of VKT (km/a).

Type	2016	2017	2018	2019	2020
PC	19000	18500	18000	17500	17000
LDV	39000	41000	43000	45000	47000
BUS	73200	73400	73600	73800	74000
HDT	50500	51000	51500	52000	52500
MC	7800	7600	7400	7200	7000

Table 3. Vehicle categories in China corresponding with those in COPERT IV.

Categories of Chinese vehicles	Vehicle categories by COPERT IV
Big-size passenger cars Middle-size passenger cars	Big-size passenger cars
Small-size passenger cars Mini passenger cars	Small-size passenger cars
Heavy-duty vans Intermediate duty vans	Heavy-duty vans
Light-duty vans Mini vans	Light-duty vans
Motorcycles	Motorcycles

Table 4. The sulfur content limit in gasoline and diesel in the CCUA (mg/kg).

Fuel	Region	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Gasoline	shanghai	1500	1000	800	800	800	800	800	500	500	500	500	50	50	50	50	10	10
	Other	1500	1000	1000	1000	800	800	800	500	500	500	500	150	150	150	150	50	50
Diesel	Shanghai	5000	5000	5000	2000	2000	2000	2000	2000	2000	2000	2000	50	50	50	50	10	10
	Other	5000	5000	5000	2000	2000	2000	2000	2000	2000	2000	2000	2000	350	350	350	350	50

Table 5. The emission factors of hybrid and natural gas vehicles.

Vehicle type	Fuel type	Emission factor (g·km^{-1})				
		CO	**NMVOC**	**NO_x**	**$PM_{2.5}$**	**PM_{10}**
PC	hybrid	0.3517[b]	0.1174[c]	0.0193[b]	0.0156[a]	0.0189[a]
	natural gas	0.8858[c]	0.0435[c]	0.1494[c]	0.009[g]	0.0255[g]
BUS	hybrid	1.1627[f]	0.4700[d]	10.6600[d]	0.1400[f]	0.1900[f]
	natural gas	1.8953[f]	0.0399[c]	5.8500[e]	0.0480[e]	0.0670[f]
Vehicle type	Fuel type	Emission factor (g·km^{-1})				
		CO_2	CH_4	N_2O	NH_3	SO_2
PC	hybrid	107.4000[f]	0.0000[c]	0.0030[c]	0.0010[c]	0.1240[d]
	natural gas	113.6100[f]	0.0093[g]	0.0000[g]	0.0000[g]	0.0000[g]
BUS	hybrid	786.2700[f]	0.0000[c]	0.0300[c]	0.0100[c]	0.2150[d]
	natural gas	955.0000[e]	1.1500[e]	0.0000[g]	0.0000[g]	0.0000[g]

[a] Liu et al., 2007; [b] Song et al., 2007; [c] Cai and Xie, 2010; [d] Che, 2010; [e] Zhou et al., 2010; [f] Zhang, 2014; [g] Tao, 2016.

Table 6. The single vehicle emissions in well-to-tank phase in 2020 (g/km).

Vehicle type	**CO**	**NMVOC**	**NO_x**	**$PM_{2.5}$**	**PM_{10}**	**CO_2**	**CH_4**	**N_2O**	**SO_2**
PC	0.0313	0.0153	0.182	0.0432	0.0585	171.77	0.006	0.006	0.2837
BUS	0.1744	0.0780	0.8849	0.2157	0.4157	852.632	0.04	0.04	1.4122