

Supplementary Material

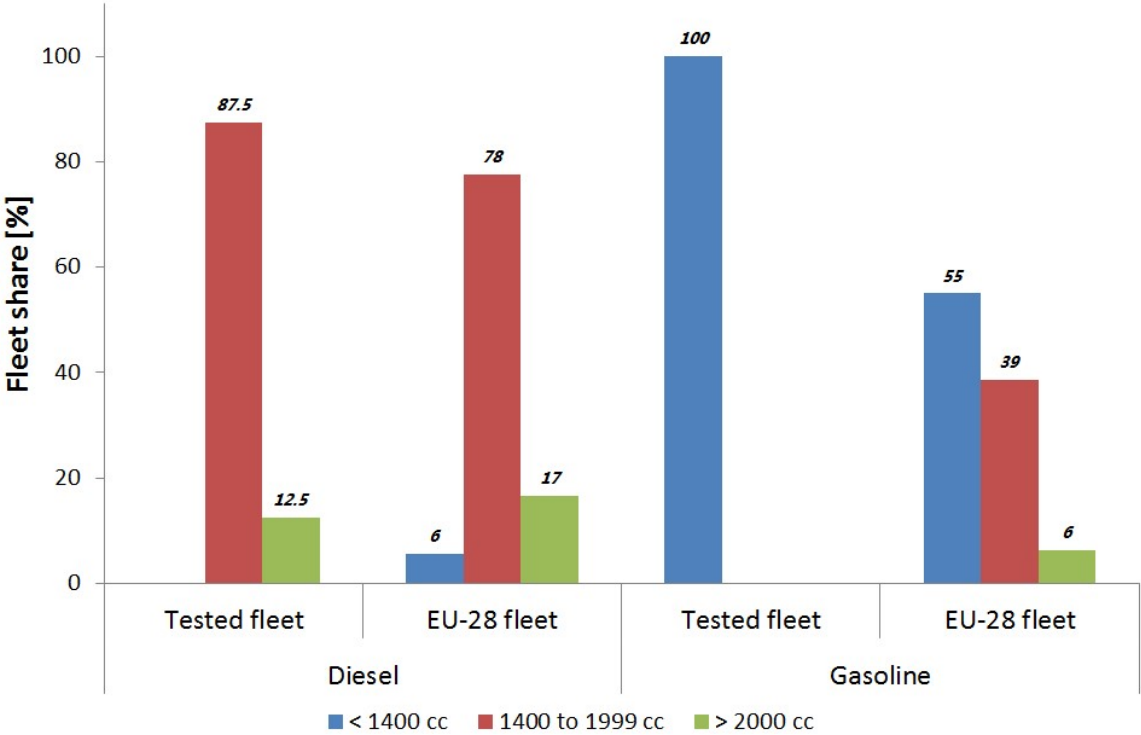
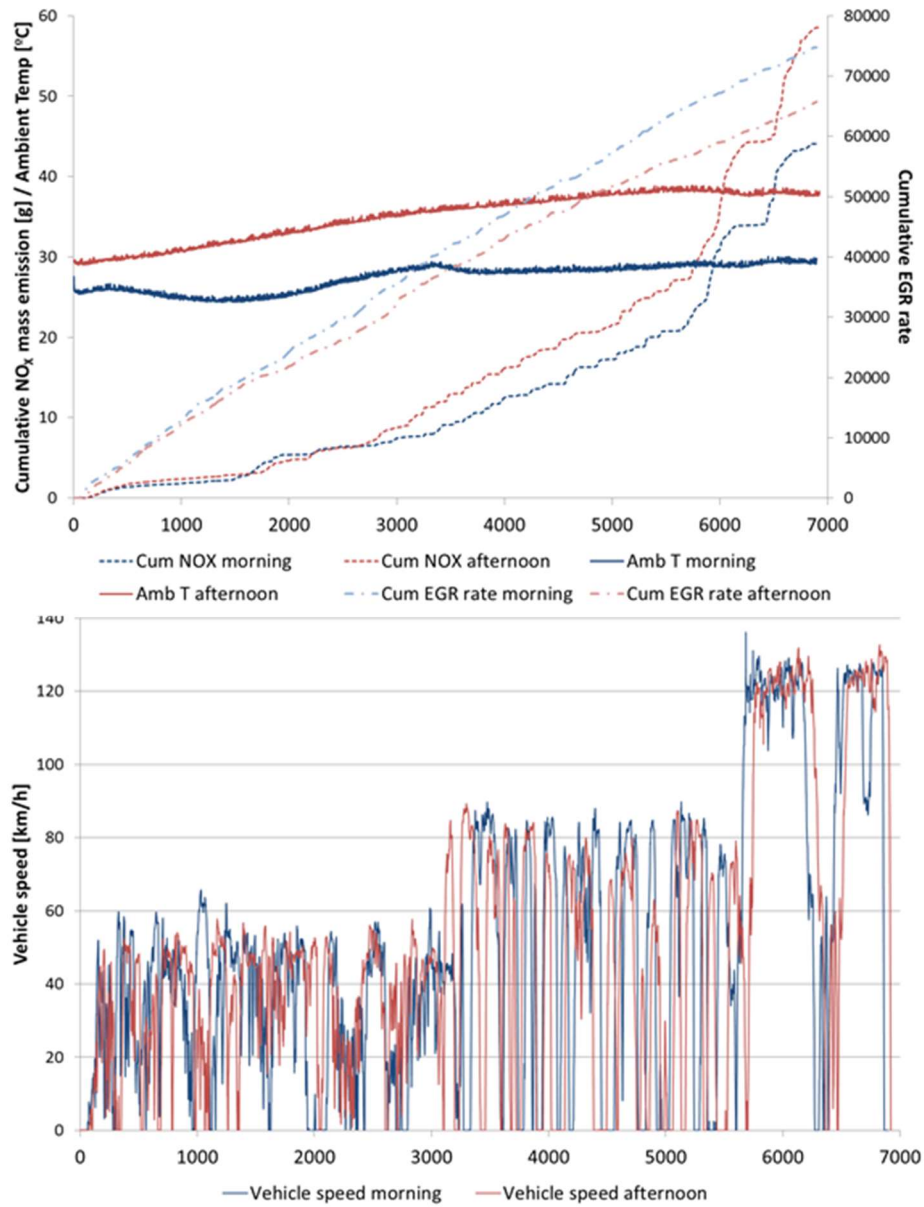
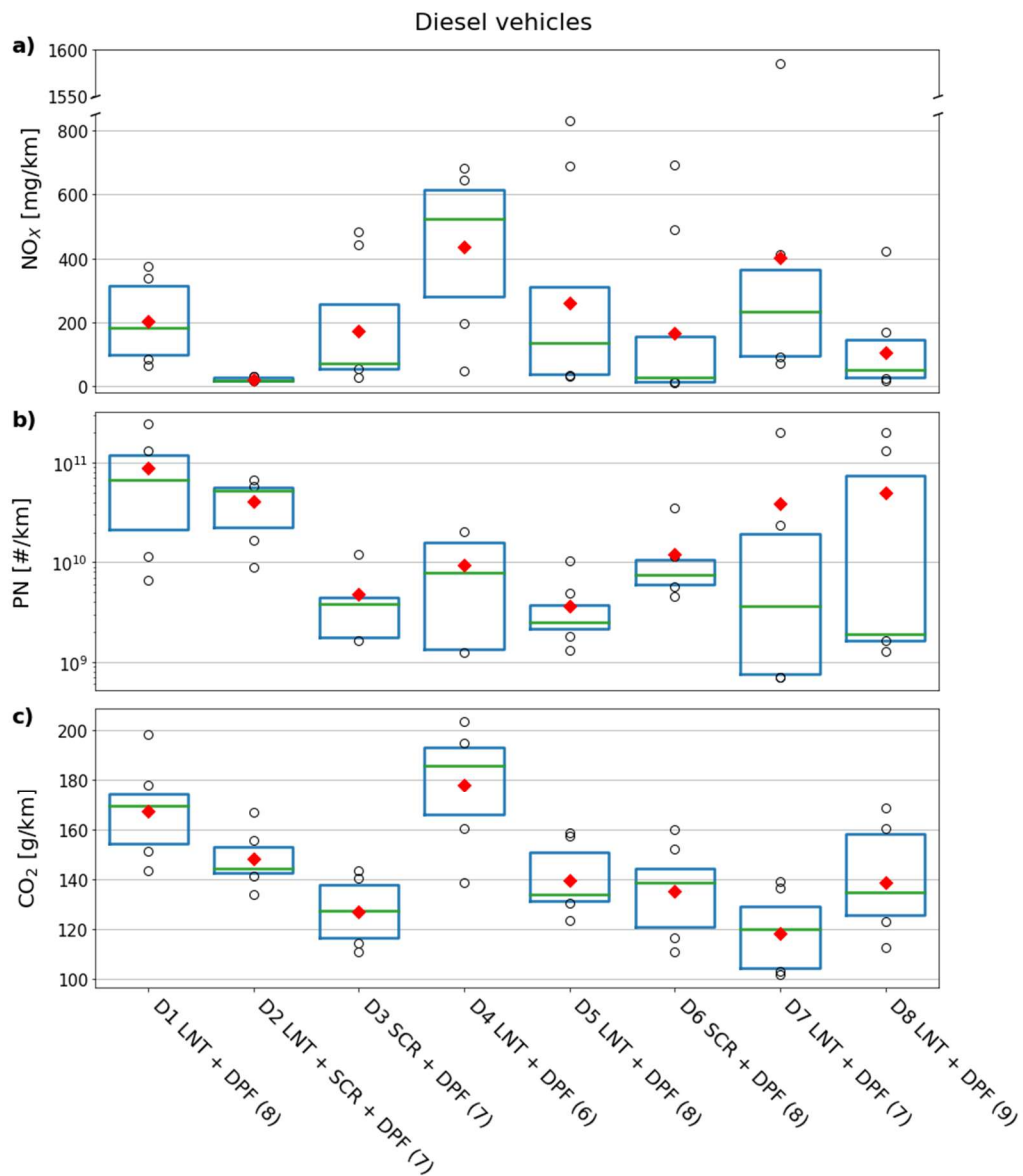


Figure S1. EU-28 fleet distribution by fuel type and engine capacity [cc] in 2016. EU-28 data source: EUROSTAT, 2018.



Parameter	Test	Urban	Rural	Motorway
Average speed [km/h]	Morning	27.2	76.2	119.2
	Afternoon	28.2	73.6	121.1
95 <sup>th</sup> percentile Speed*Acc_pos [m <sup>2</sup> /s <sup>3</sup> ]	Morning	12.86	20.38	24.82
	Afternoon	12.63	17.62	21.87
Average Temperature [C]	Morning	26.8	28.4	29.3
	Afternoon	34.0	37.0	38.1
CO <sub>2</sub> [g/km]	Morning	150.1	107.0	162.1
	Afternoon	151.8	108.0	163.2
NO <sub>x</sub> [mg/km]	Morning	333	377	706
	Afternoon	472	515	884

**Figure S2.** Top panel: cumulative NO<sub>x</sub> emission [g], ambient temperature [C], and cumulative EGR rate on two RDE-compliant tests done on the same route on D6 in the morning and in the afternoon. Central panel: GPS vehicle speed from both tests [km/h]. Bottom panel: overview of test characteristics per bin: average speed [km/h], dynamicity (expressed as the 95<sup>th</sup> percentile of speed\*positive acceleration [m<sup>2</sup>/s<sup>3</sup>], CO<sub>2</sub> EF [g/km], and NO<sub>x</sub> EF [mg/km].



**Figure S3.** Boxplot of emission factors per diesel vehicle for complete tests a) NO<sub>x</sub> [mg/km], b) PN [# /km], and c) CO<sub>2</sub> [g/km]. The box represents the 1<sup>st</sup> and 3<sup>rd</sup> quartile, the green line is the median, the red diamond is the mean, and the black circles are data points beyond the interquartile range. The number in the label is the vehicle code as in Table 1, and the number in brackets is the number of tests performed on that vehicle. Note that a) the y-axis is broken in two sections.

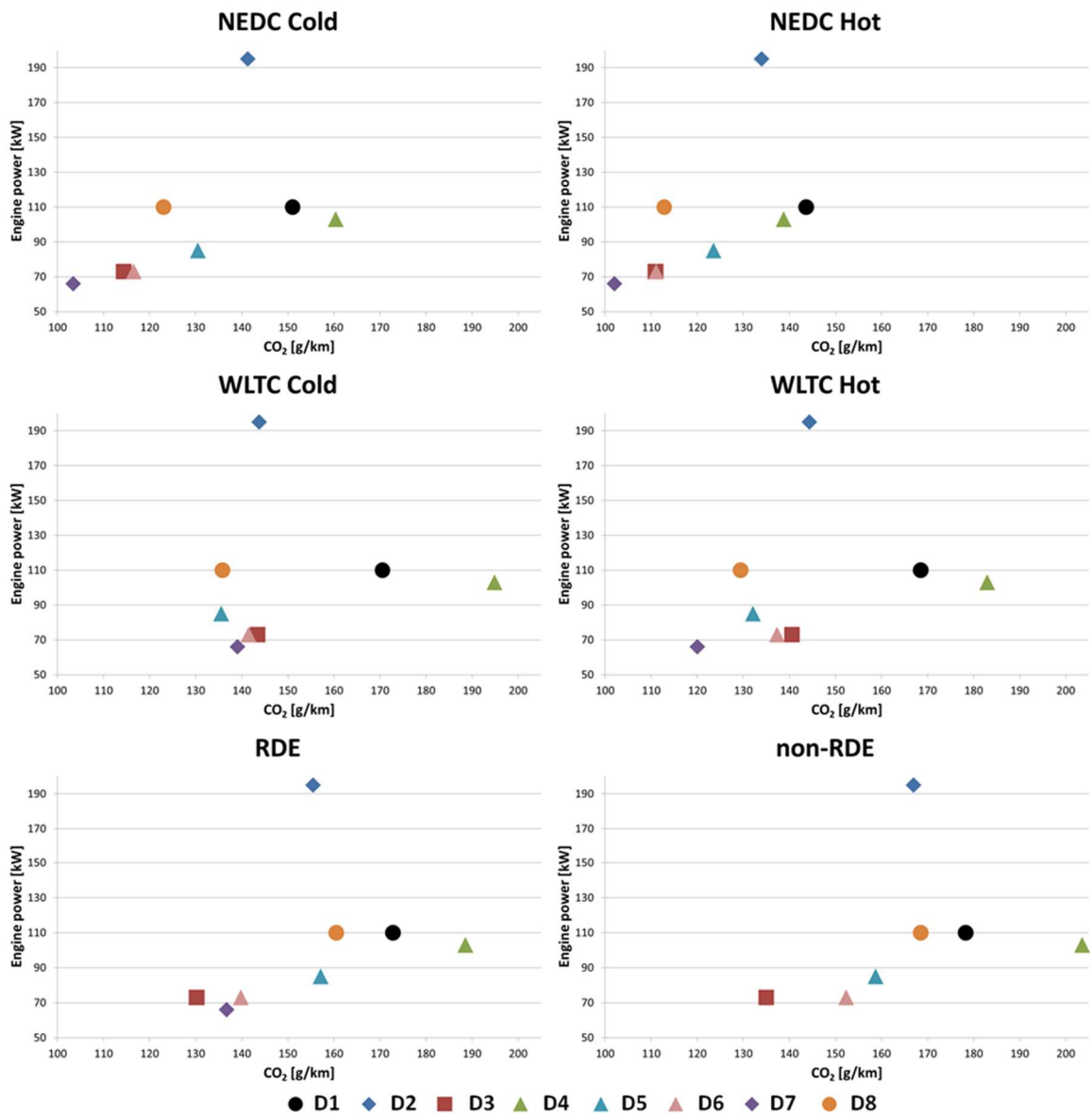
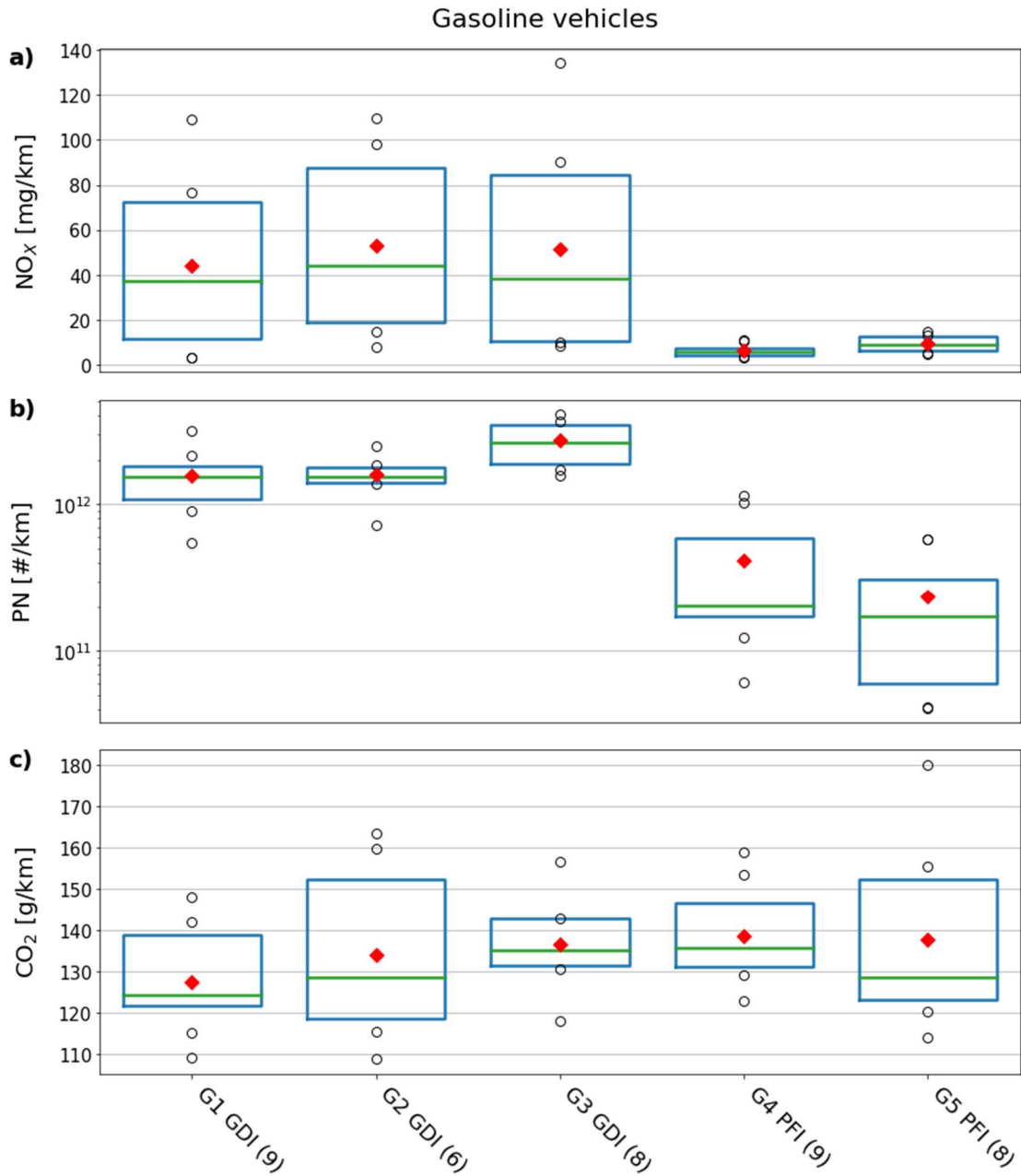
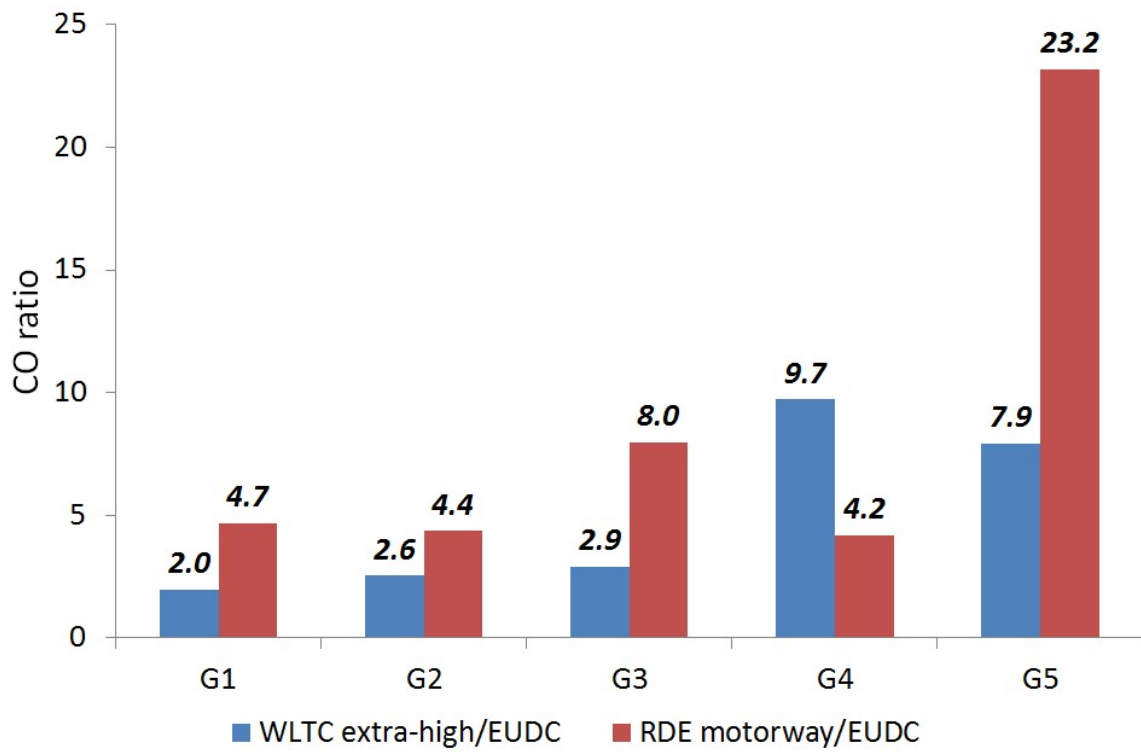


Figure S4. CO<sub>2</sub> [g/km] emission as function of the engine power [kW] per diesel vehicle for complete tests.



**Figure S5.** Boxplot of emission factors per gasoline vehicle for complete tests a)  $\text{NO}_x$  [mg/km], b) PN [# /km], and c)  $\text{CO}_2$  [g/km]. The box represents the 1<sup>st</sup> and 3<sup>rd</sup> quartile, the green line is the median, the red diamond is the mean, and the black circles are data points beyond the interquartile range. The number in the label is the vehicle code as in Table 1, and the number in brackets is the number of tests performed on that vehicle.



**Figure S6.** Ratio of the CO EF over WLTC extra-high over CO EF over EUDC, and ratio of the CO EF over RDE motorway over CO EF over EUDC for all gasoline vehicles.