

## Supporting Information (SI):

**Table SI-1: Fatty acid profile of biodiesels used [derived from reference]**

FAME	Biodiesel feedstocks		
	<i>Cryptocodinium cohnii</i> (Microalga)	Cotton seed oil	Waste cooking oil
C14:0	8.30	0.544	0.00
C16:0	22.20	17.854	11.2
C18:0	0.56	2.532	3.50
C18:1(Tran)	0.00	24.203	2.70
C18:1 (cis)	0.00	1.268	64.4
C18:2(cis-9,12)	0.00	50.246	18.3
C18:3(all cis 6,9,12)	0.41	1.537	0.00
C20:3	0.50	0.00	0.00
C20:4	0.70	0.00	0.00
C20:5 (EPA)	1.70	0.00	0.00
C22:5	17.90	0.00	0.00
C22:6 (DHA)	47.70	0.00	0.00
SFAs	31.06	21.805	14.72
MUFA	0.00	26.316	67.03
PUFA	68.94	51.879	18.25
Average chain length	20.38	18.94	18.78
Average unsaturation	3.46	1.47	1.03

**Table SI-2: Properties of biodiesels and reference diesel used [derived from reference]**

Fuel property	Test method	Microalgal biodiesel	Cotton seed oil biodiesel	Waste cooking oil biodiesel	Biodiesel Standard ASTM 6751-12	Biodiesel Standard EN 14214	Petro-Diesel
CN	DIN 51773	46.5	87	58.6	47 min	51	53.3
Kinematic viscosity @40°C ( mm <sup>2</sup> /s)	ASTM D445	5.06	4.17	4.82	1.9-6.0	3.5-5.0	2.64
Density @15°C ( kg/L)	ASTM D4052	0.912	0.88	0.87	0.86-0.90	0.86-0.90	0.84
HHV ( MJ/kg)	-	39.86	39.73	39.9	-	-	-
LHV ( MJ/kg)	-	37.42		37.2	-		44.0
Acid value ( mg KOH/g)	ASTM D974	0.14		-	0.5 max	0.5max	0.0
Flash point (close cup) °C	ASTM D93	95.0		-	93 min	-	71.0
Flash point (°C)	ASTM D93	-		≥180	130	120	-
Sulfur content ( mg/kg)	ASTM D7039	7.5		-	15max	10max	5.9
cloud point (°C)	IP 309	16.1		-	report	report	4.0
Lubricity @°60 (mm)	IP 405	0.136		-	-	-	0.406
copper corrosion (3 hrs @50°C)	ASTM D130	1a		-	1max	1 max	1a
water sediment ( vol%)	ASTM D2709	0		-	0.005% max	0.005% max	0.0
FBP (°C)	ASTM D86	-		-	-	-	357.7
Oxygen content ( vol%)	-	10.47	10.91	10.93	-	-	-
Hydrogen content ( vol%)	-	11.12	11.94	12.21	-	-	-
Carbon content ( vol%)	-	78.41	77.15	76.93	-	-	-

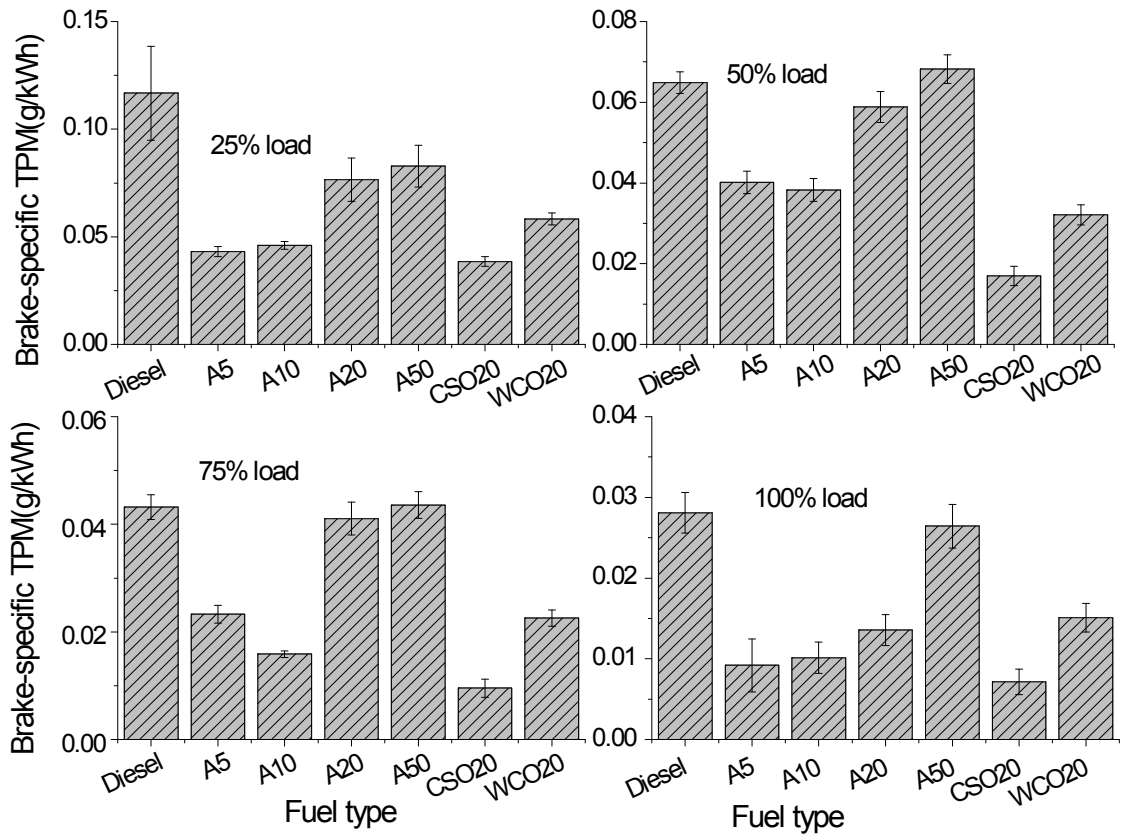
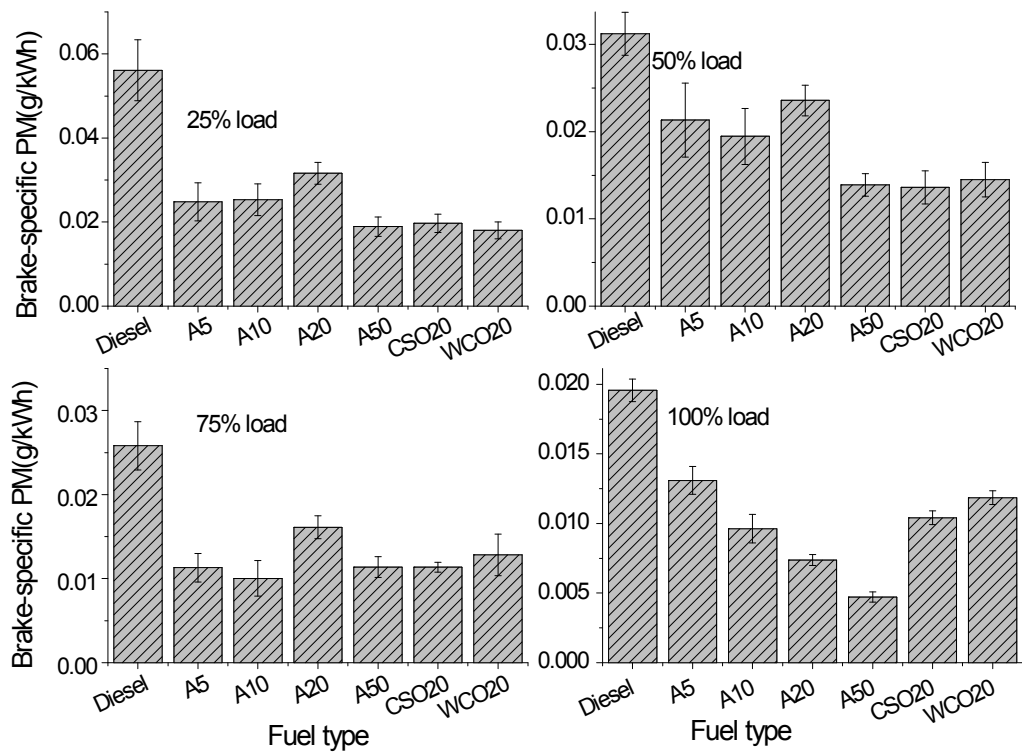


Figure SI-1: Brake-specific TPM emissions of diesel and biodiesel blends



**Figure SI-2:** Brake specific TPM emissions measured by DustTrak of the diesel and biodiesel blends

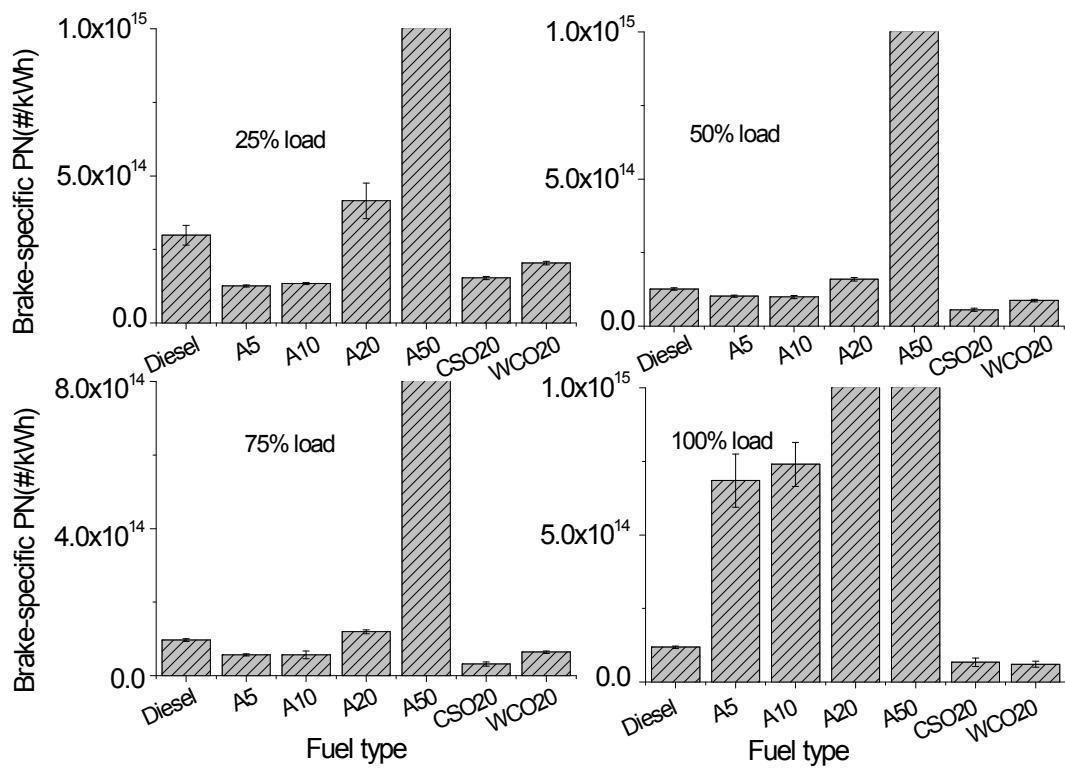


Figure SI-3: Brake specific total PN emissions of the diesel and biodiesel blends