Table 3 Fuel-based average EFs in the present study and previous studies (g ŧkg-1 fuel)

(NONE=No treatment of emissions, SRC=Selective catalytic reduction)

Vessel ID	CO_2	CO	NO	NO_2	N_2O	NO_X	TVOCs	PM	SO_2	
HH	3071±1565	30.2±16.2	98.2±37.2	15.5±5.45	1.28±1.70	115±44.3	23.7±21.0	9.40±2.13	1.60	
DFH	3153±176	6.93±1.00	30.2±1.60	5.09±0.42	0.38±0.18	35.7±2.20	1.24±0.04	0.72±0.33	0.92	
XYH	3151±175	9.20±2.95	26.6±1.63	4.71±0.42	0.30±0.15	31.6±2.20	4.18±0.15	0.16±0.07	2.60	
Commercial vessel (Williams et al., 2009)	3170	7-16	-	-	-	60-87	-	-	6-30	
Cargo vessel (Moldanova et al., 2009)	3441	2.17	-	-	-	73.4	-	5.3	39.3	
Diesel engine (Haglind, 2008)	-	7.4	-	-	-	87	-	7.6	54	
Ocean-going ships (Sinha et al., 2003)	3135	19.5	-	-	-	22.3	-	-	2.9	Distillate fuel
Ocean-going ships (Sinha et al., 2003)	3176	3.0	-	-	-	65.5	-	-	52.2	Residual fuel
Cargo and passenger ships(Endresen, 2003)	3170	7.4	-	-	0.08	57-87	2.4	1.2-7.6	10-54	
Ships operating in harbor areas(Pirjola et al., 2014)	-	-	42-72	-	-	65-86	-	-	4.6-9.8	NONE
	-	-	16-49	-	-	25-79	-	-	5.4-17.0	SRC
Ships operating in Port(Diesch et al., 2013)	-	-	16	37	-	53	-	-	7.7	

Table 4. Power-based EFs in present study and previous studies (g ŀkWh^{-1})

Vessel ID	CO_2	CO	NO	NO_2	N_2O	NO_X	TVOCs	PM	SO_2
HH	699±352	7.38±3.76	22.0±8.41	3.45±1.24	0.30±0.39	25.8±10.0	5.44±4.84	2.09±0.48	0.36
DFH	631±35.2	1.39±0.20	6.04±0.32	1.02±0.08	0.08±0.04	7.14±0.44	0.17±0.01	0.14±0.07	0.18
XYH	697±38.5	2.01±0.65	5.87±0.36	1.04±0.09	0.07±0.03	6.97±0.48	0.92±-	0.04±0.01	0.57
Tanker(Winnes and Fridell, 2010)	-	1.61	-	-	-	7.82	-	0.58	-
Berthed ships(Cooper, 2003)	653-699	0.33-1.71	-	-	-	9.6-20.2	-	0.14-0.54	0.4-9.6
Crude Oil Tanker(Agrawal et al., 2008)	588-660	0.77-1.78	-	-	-	15.8-21.0	-	1.10-1.78	7.66-8.60
Cruise ships(Poplawski et al., 2011)	-	-	-	14.0	-	-	-	2.91	4.20